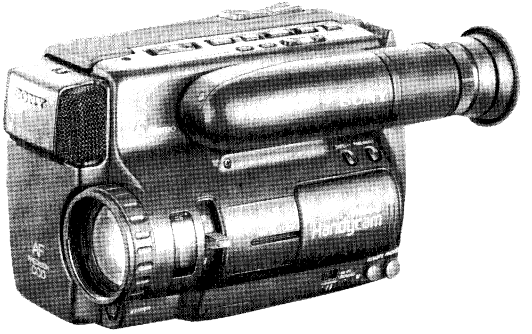
CCD-TR75E

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model



Handycam

FL MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL II" (9-972-705-11).

SPECIFICATIONS

System

Video recording system	Four Rotary heads, Helical scanning FM system
Audio recording system	Four Rotary heads, Helical scanning FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 20.051 mm/second. LP mode: Approx. 10.058 mm/second
Recording time	SP mode: 1 hour and 30 minutes (P5-90) LP mode: 3 hours (P5-90)
Playback time	SP mode: 1 hour and 30 minutes (P5-90) LP mode: 3 hours (P5-90)
Fast-forward/rewind time	Approx. 8.5 min. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5 – 68 mm (11/32 to 2 3/4 inches), F 2.0 with macro filter diameter: 37 mm (1 1/2 inches)
Auto focus system	TTL
Colour temperature	Automatic, HOLD, ☼ (indoor) 3200K, ☀ (outdoor) 5,800K
Minimum illumination	6 lux (F 2.0)
Illumination range	6 lux – 100,000 lux (0.6 – 9,290 footcandles)
Recommended illumination	More than 100 lux (9.3 footcandles)
Aperture correction	Automatic

Input and output connector (AEP, UK model only)

Video output	Phone jack, 1 Vp-p, 75 ohms unbalance sync negative
Audio output	Phone jack Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms

— Continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

Input and output connector (E, Australian model only)

Video input/output	Phone jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	Phone jack Input: –7.5 dBs (0 dBs=0.775 Vrms) (impedance more than 47 kilohms) Output: –7.5 dBs (at output impedance 47 kilohms) impedance more than 2.2 kilohms

DC OUT	Special minijack, DC 5V
Headphones jack	Stereo minijack
Remote jack	Stereo mini-minijack
MIC jack	Stereo minijack, −66 dBs, low inpedance with 2.5−3 V DC output, impedance 6.8 kilohms

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	5.3 W (camera recording) including the viewfinder
Installation	Vertically, Horizontally
Operating temperature	0°C to 40°C (32° F to 104° F)
Storage temperature	−20°C to +60°C (14° F to +140° F)
Dimensions	Approx. 109 × 106 × 183 mm (w/h/d) (4 3/8 × 4 1/4 × 7 1/4)
Weight	Approx. 790 g (1 lb 12 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, stereo type

Supplied accessories

- Battery pack NP-55 (1)
- AC power adaptor AC-V30 (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90E or RFU-89EA with an aerial selector and a screw driver (1)
- Step-up-ring ø37mm → ø46mm (1)
- Shoulder strap (1)
- Jack cover (1)
- Lens cap (1)
- Tape (1)
- Handy Manual

Design and specifications are subject to change without notice.

Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

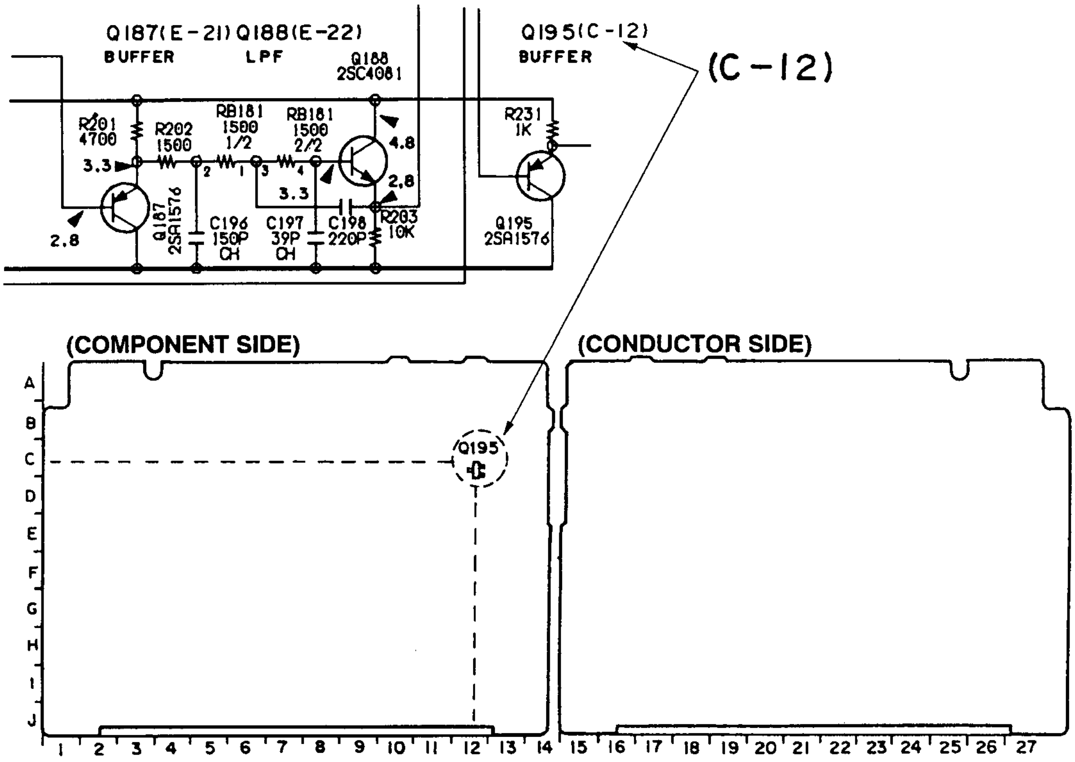
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 98 and 160.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✱] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, lead clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)

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There is the color reproduction standard frame at the back of the book.

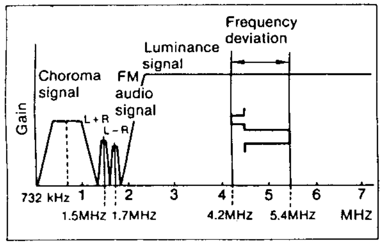
SECTION 1
GENERAL

This section is extracted from instruction manual (AEP Model).

Introduction

(A-1)

Frequency allocation of the hi-fi system

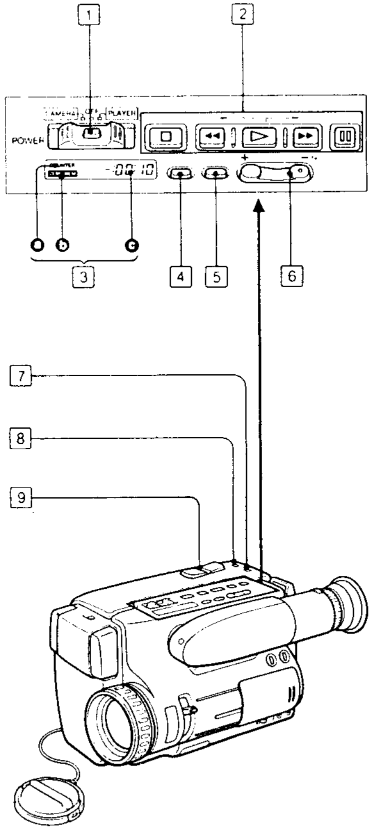


Hi-Fi Stereo System

On the 8mm video standard track the sound is recorded/played back in hi-fi monaural. On this camcorder, an additional hi-fi stereo sound can be recorded on the standard track.
The hi-fi stereo sound is recorded as L + R on the 1.5 MHz carrier and L − R on the 1.7 MHz carrier in FM as illustrated. **(A-1)** This method was adopted to maintain compatibility with the conventional hi-fi monaural sound.
When playing back the tape recorded in this hi-fi stereo system, a matrix circuit is used to produce the L and R stereo sounds separately.
When a conventional hi-fi monaural model is used to play back a tape recorded by this camcorder in hi-fi stereo, the playback sound will be in a L + R monaural sound. This is because the monaural models will play back only the sound recorded in the 1.5 MHz carrier.
The hi-fi stereo system of this camcorder enables you to enjoy a live stereo sound atmosphere.

Compatibility with the conventional 8 mm video format
When you playback a tape recorded in stereo hi-fi on a conventional 8 mm video equipment, the sound will be in monaural.

(B-1)



Identifying the Parts

For details on the use of each control, refer to the pages indicated in the circle.

(B-1)

1 **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

2 **Tape transport buttons and pause indicator**
▷ (playback)
►► FF (fast forward)
◄◄ REW (rewind)
□ (stop)
▯▯ (pause)
During the pause mode the indicator lights.

3 **Display window**
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory) indicator
ⓒ Indicates the time, date or the tape counter

4 **RESET button**
Press to reset the counter to zero.

5 **ZERO MEM (zero memory) button ㉚, (57)**
Use to memorize the counter zero point.

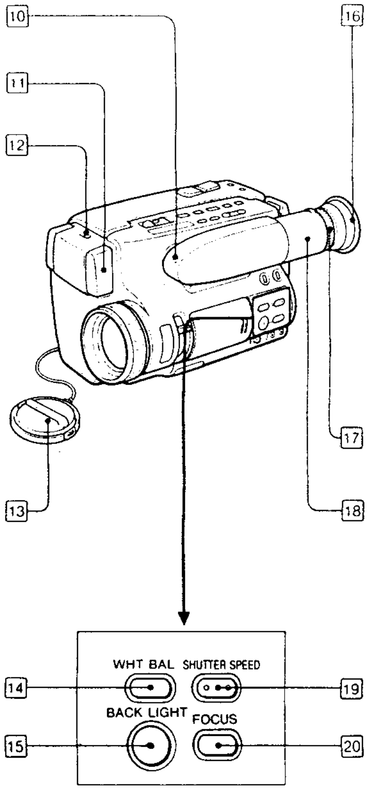
6 **EDITSEARCH ⊜ button ㉘–㉜**

7 **Caution lamp**
Blinks when a problem has occurred.

8 **DEW lamp**
Blinks when moisture has condensed inside the unit.

9 **Power zoom button ㊶**

(B-2)



Identifying the Parts

(B-2)

10 Camera recording/battery lamp
Lights during camera recording. It blinks when the battery is exhausted.

11 Built-in microphone (stereo)

12 BUILT-IN MIC switch ㉗
Usually set to the green position. When using the camcorder in a strong wind, set to "WIND."

13 Lens cap
To remove the lens cap, squeeze the sides. Hook it on the grip strap so it will not get lost.

14 WHT BAL (white balance) button ㊲

15 BACK LIGHT button ㊵

16 Eyecup

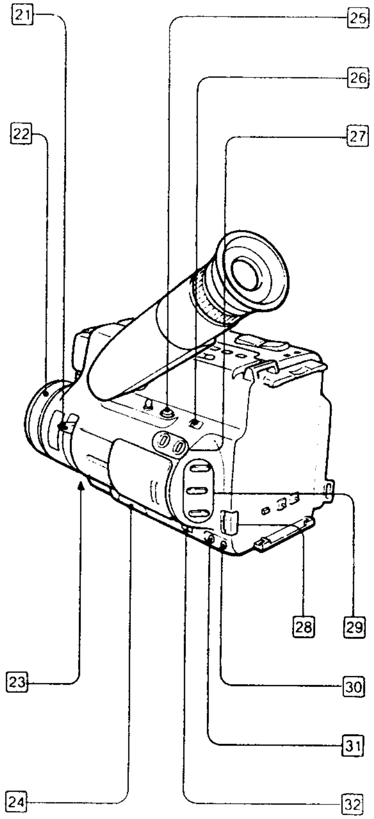
17 Viewfinder lens adjustment ring
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

18 Viewfinder
The picture being recorded or played back can be monitored in monochrome here. Also marks such as the caution indicators and function modes appear in here.

19 SHUTTER SPEED button ㊴
Used to select the shutter speed.

20 FOCUS button
Used for manual focusing.

(B-3)



Identifying the Parts

(B-3)

21 Zoom lever ㉟, ㊶
Macro set button ㊷

22 Focus ring ㉟

23 FADER button ㊸

24 Lithium battery compartment ⑳

25 REC START/STOP button ㉘
Use when recording in the low position.

26 Recording mode/EDIT switch ㉕, (58)
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	SP ↔ LP	EDIT ←	EDIT →
Function	Recording mode switch	EDIT switch	

27 DATE and TIME buttons
Press to display or turn off the date or time.

28 BATT (Battery eject) knob ⑮

29 Superimpose buttons ㊹
MEMORY button
COLOR/MODE button
SUPERIMPOSE ON/OFF button

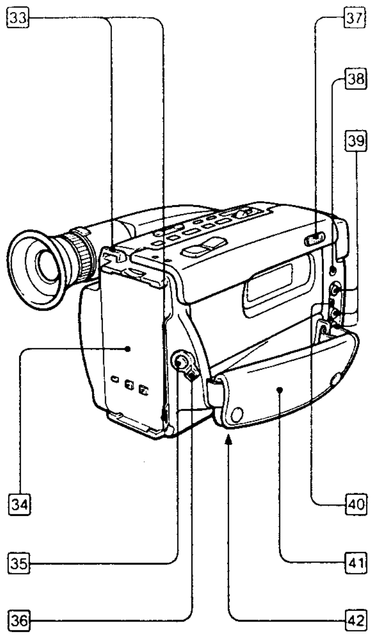
30 PHONES (Headphones) jack (stereo mini-jack)

31 ⒧ REMOTE control jack (stereo mini-mini-jack)
Connect a wired remote control unit, an editing controller, or other equipment here.

32 HI-FI SOUND switch (54)
Set to the appropriate position when playing back the tape.

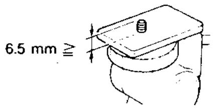
About ⒧ (LANC)
⒧ stands for Local Application Control Bus System. The ⒧ connector is used for controlling the tape transport of video equipment and the peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(B-4)



(B-5)

42



(B-4)

33 **Hooks for shoulder strap**
Attach the shoulder strap.

34 **Battery mounting surface**

35 **START/STOP button**
Press to start and stop camera recording.

36 **STANDBY switch**
Slide up to set the camcorder to the standby mode.

37 **Lid lock**
Slide to the left to open the cover.

38 **MIC jack (PLUG IN POWER) (stereo minijack)**
Connect an external stereo microphone (not supplied).

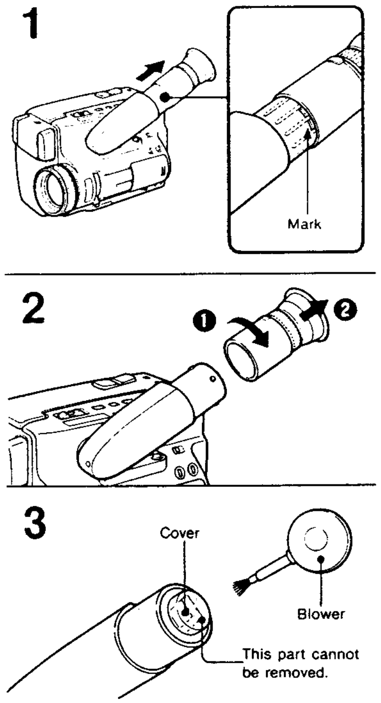
39 **VIDEO/AUDIO output jacks (phono jacks)**

40 **DC OUT (RFU adaptor DC output) jack (special minijack)**
Attach the supplied RFU adaptor here if necessary. This jack also supplies power to an external microphone.

41 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

42 **Tripod receptacle**
Note that when you are attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5mm. Otherwise the screw may damage the inner parts of the camera.
(B-5)

(B-7)



To remove dust from inside the viewfinder (B-7)

1 **Pull out until the mark appears.**

2 **Turn counterclockwise until it stops and pull out.**

3 **Clean the surface of the cover with a blower.**

Connecting the Power Sources

First, Choose the Power Source.

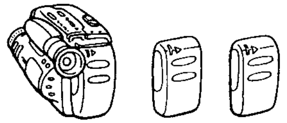
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-66H, NP-77, NP-77H
	Alkaline batteries	Battery case EBP-TR, EBP-55, EBP-77
Indoors	House current	AC power adaptor AC-V30 (supplied), AC-V55
In the car	12V or 24V car battery	DC pack DCP-77, DCP-55 (DCC-16B car battery cord supplied)

Note on power source
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If disconnected accidently supply the power again immediately.

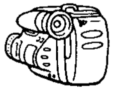
Getting the Most from the Battery Pack

How to Prepare the Rechargeable Battery Pack

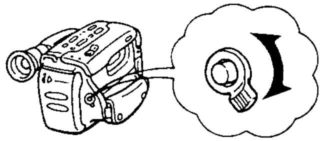
Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned.
"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.



Battery life is shorter in a cold climate
Battery efficiency is decreased and the battery will be used up more quickly.

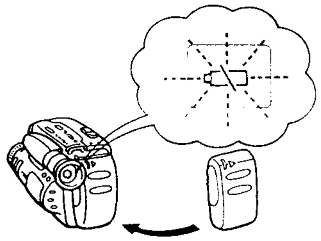


Leaving the unit in the standby mode will consume power and shorten the available battery life. To conserve power, turn the STANDBY switch off between recordings. A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, by viewing through the viewfinder, and in using autofocus, the battery is being expended. The battery is also being expended when a tape is inserted or removed.



When the Rechargeable Battery Pack should be Replaced

When the mark in the viewfinder changes from slow blinking to rapid blinking while you are recording,
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

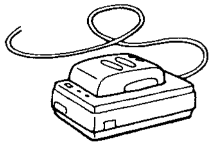


Notes on Charging

Before using the battery pack, charge it sufficiently. A brand-new battery pack is not charged.

Recharge the battery pack only when it is exhausted.

- If recording is completed before the mark ⊂⊐ appears in the viewfinder, it is recommecded that you remove the tape, set POWER to CAMERA, slide up the STANDBY, and leave the camcorder until the ⊂⊐ mark blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully charge and discharge the battery again.



Recharge the battery pack before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and − terminals with a soft cloth or paper.

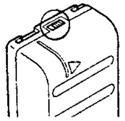
Notes on the Rechargeable Battery Pack

Why the battery pack heats up
During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus it is recommended you charge the battery before using.

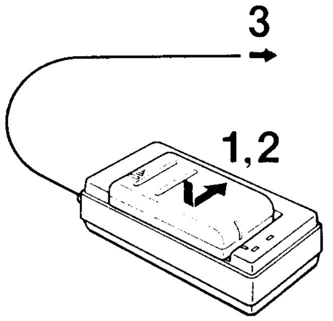
How to use the switch on the battery pack
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.



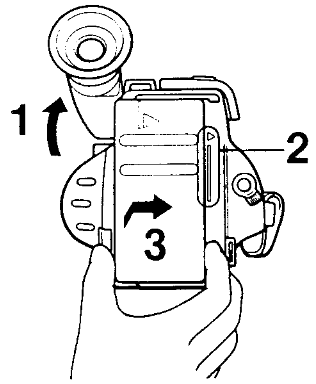
How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times under normal temperatures. If the ⊂⊐ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging
Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C is recommended.

(C-1)



(C-2)



Using the Battery Pack

Step 1

Charge the battery pack. (C-1)

1 Align the right side of the battery pack with the line on the AC power adaptor.

2 Slide in the battery pack to the right.

3 Connect the AC power adaptor to a wall outlet.

Approximate required charging time (minutes) when using AC-V30

NP-55*	NP-66H	NP-77	NP-77H
60	110	120	140

* Supplied

See the instruction manual of the AC power adaptor for details.

Step 2

Mount the battery pack on the camcorder. (C-2)

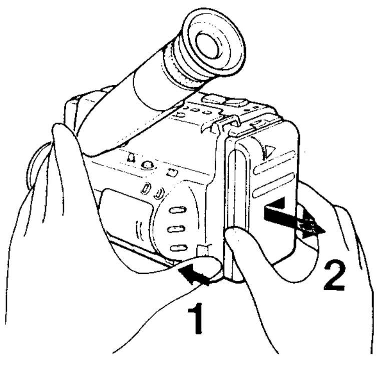
1 Lift up the viewfinder.

2 Align the right side of the battery pack with the line on the camcorder.

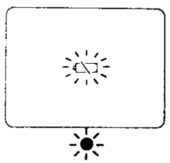
3 Slide the battery pack to the right.

Note
Make sure the battery fits completely on the mounting surface of the camcorder. Imperfect fit may damage the projections on the camcorder.

(C-3)



(C-4)



To remove the battery pack (C-3)

While pressing the BATT knob in the direction of arrow, slide to the left and pull out the battery pack as illustrated.

Battery life

A fully charged battery pack lasts for:

NP-55*	NP-66H	NP-77	NP-77H
60	110	120	150

(Approx. minutes, continuous recording when used indoors)

* Supplied

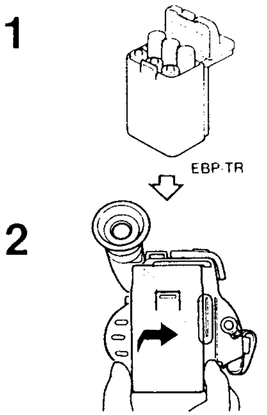
When the battery becomes weak (C-4)

The ▭ indication and red lamp blink slowly in the viewfinder. Replace the battery pack with a fully charged one when they blink rapidly.

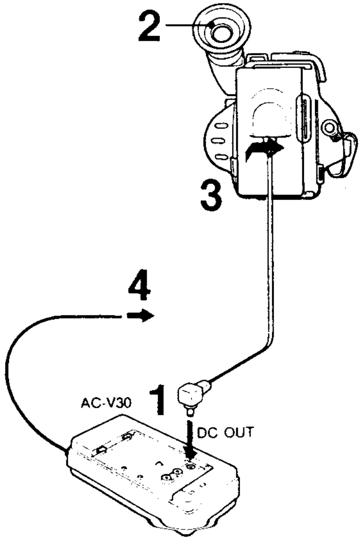
Other options for charging

- AC-V55 AC power adaptor: You can charge two battery packs one after another.
- BC-55 portable battery charger: You can charge a battery pack on 100-240 V AC.
- DC-V30 car battery charger: You can charge a battery by connecting the car battery charger to the cigarette lighter socket. This battery charger can also supply power for Sony 8 mm equipment that operates on a battery pack.
- NP-4000 rechargeable battery pack: You can use it for long outdoor recording.

(C-5)



(C-6)



Connecting the Power Sources

Using Alkaline Batteries

(C-5)

The EBP-TR battery case is required (not supplied.)

1 **Insert 6 AA size batteries into the battery case.**

2 **Attach the case in the same way as the battery pack.**

Battery life

	Minutes
EBP-TR	Approx. 60
EBP-55*	Approx. 60
EBP-77*	Approx. 180

(Using Sony alkaline batteries. continuous recording when operated indoors)
*See "Other options" below.

Notes on battery life
- Batteries will not last as long in cold place.
- No indication appears in the viewfinder when the batteries are weak.

Notes on using the EBP-TR
For your safety, make sure you remove the case from the camcorder when you are replacing the batteries.

Other options
- EBP-55 (6 AA size batteries)
- EBP-77 (12 AA size batteries)

Using House Current

(C-6)

Use the supplied AC-V30 AC power adaptor.

1 **Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.**

2 Lift up the viewfinder.

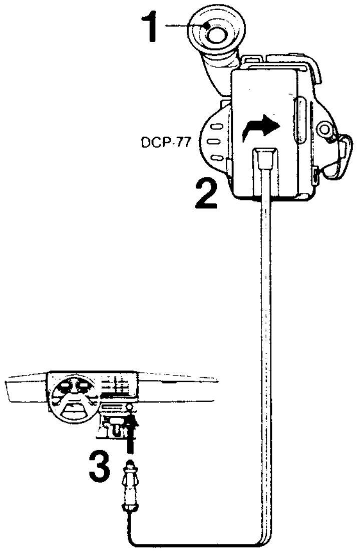
3 **Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.**

4 **Connect the AC power adaptor to a wall outlet.**

We recommend the use of the AC power adaptor while viewing the playback picture on the TV, editing tapes or recording a TV program, as you do not need to worry about running out of power.
See the instruction manual of the AC power adaptor for details.

Other options
The AC-V55 AC power adaptor can also be used.

(C-7)



Connecting the Power Sources

Using Car Battery

(C-7).

The DCP-77 DC pack is required (not supplied).

1 **Lift up the viewfinder.**

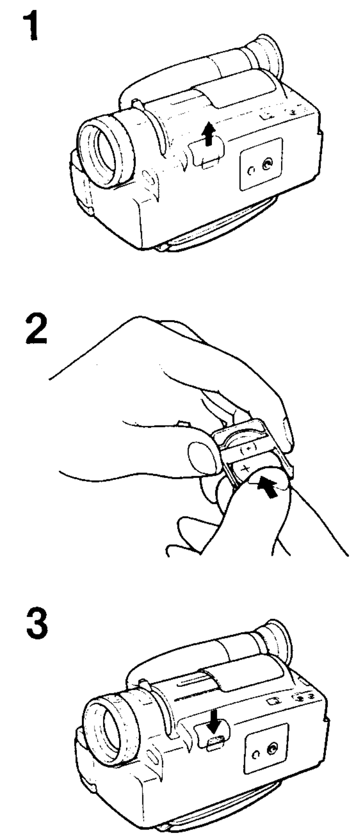
2 **Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.**

3 **Connect the cord to the cigarette lighter socket of a car (12V or 24V).**

To remove the DC pack
While pressing the BATT knob on the camcorder, slide the DC pack to the left and pull out.

Other options
- The AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this camcorder on a 12V or 24V car battery.
- DCP-55 DC pack can also be used to operate this camcorder on a 12V or 24V car battery.

(D-1)



Setting the Date and Time

Inserting the Lithium Battery

(D-1)

This camcorder uses a lithium battery to activate the clock and to keep titles in memory. Before operating it for the first time, install the supplied lithium battery.

1 **Pull out the lithium battery holder from the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side facing the (+) on the battery holder.**

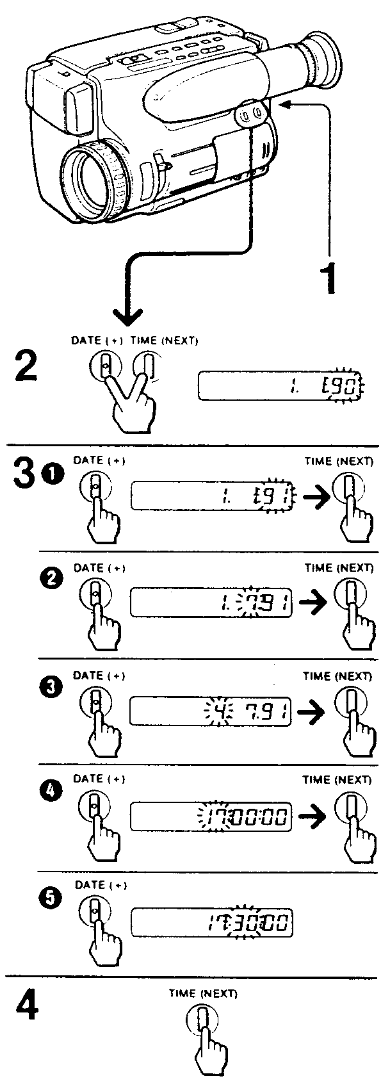
3 **Put the lithium battery holder back into the camcorder.**

To change the lithium battery
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on battery life
The battery lasts for approximately 1 year under normal operation. When the lithium battery becomes weak, the time indication keeps blinking in the display window and blinks in the viewfinder for about 5 seconds when the POWER switch is set to CAMERA. When this happens, **replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.** While replacing the lithium battery, keep the battery pack or other power source attached. If the battery pack or other power source was not attached while replacing, readjustment of the date and time is necessary.

Cautions
- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure good contact.
- Be sure to install the battery with the correct polarity.
- Do not hold the battery with metallic tweezers, as a short-circuit may occur.
- Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in a fire.

(D-2)



Setting the Date and Time

(D-2)

1 **Make sure that a power source is connected, set POWER to CAMERA, and slide STANDBY up.**

2 **Press DATE and TIME simultaneously for more than 3 seconds until the date indication appears in the display window. DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).**

3 **Set the year, month, day, hour and minute, in this order.**
First adjust the blinking digits with + and then press NEXT.

4 **Press NEXT to set the second.**
The clock starts operating.

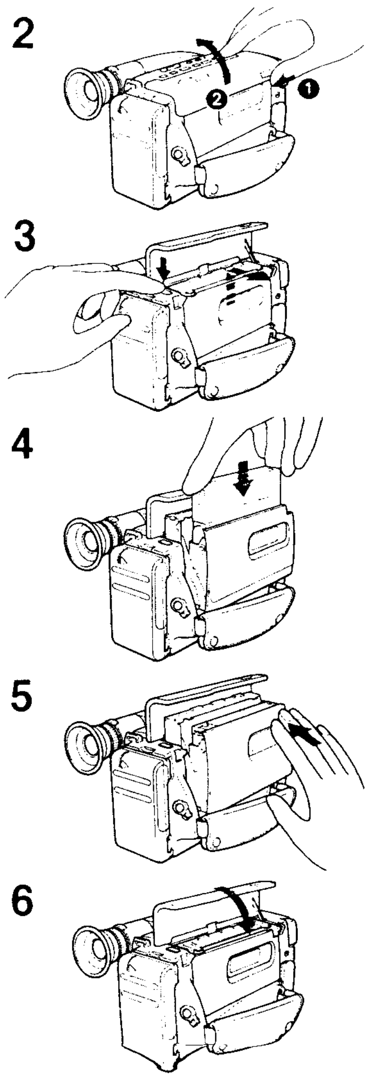
To correct the date and time setting
Repeat steps 2 to 4.

To advance the digits faster
Keep + pressed.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

Inserting a Tape

(E-1)



Inserting a Tape

(E-1)

1 Make sure a power source is connected.

2 While sliding the lid lock in the direction of the arrow lift up the lid until it clicks.

3 Press EJECT.
The lip of the cassette compartment will automatically lift up and open.

4 Insert the cassette with the window facing out.

5 Press the PUSH mark on the cassette compartment cover to close it.

6 Close the lid.

Ejecting the Tape

1 Make sure that a power source is connected.

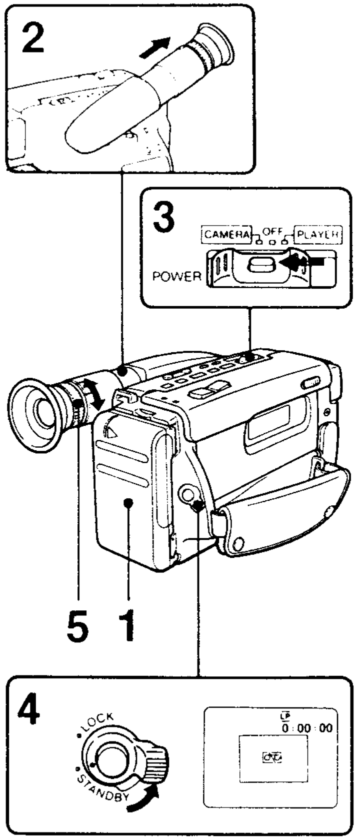
2 While sliding the lid lock in the direction of the arrow, lift the lid up until it clicks.

3 Press the EJECT.
The lip of the cassette compartment will lift up and automatically open.

4 Take out the cassette and press the PUSH mark on the comparment to close it.

5 Close the lid.

(F-1)



Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust when using the first time, or when using after someone else.

(F-1)

1 Make sure a power source is connected.

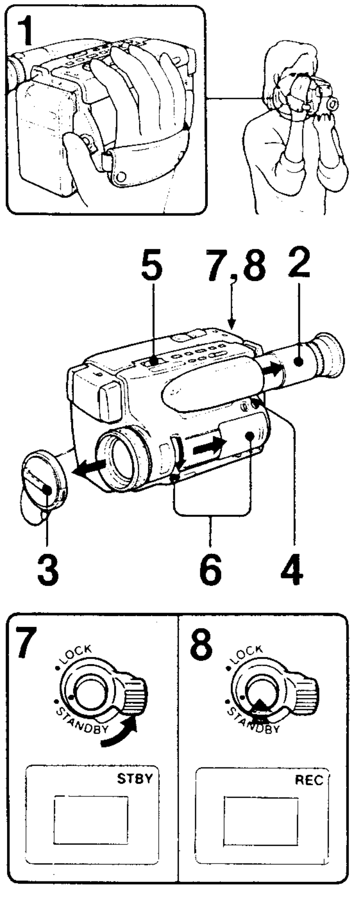
2 Pull the viewfinder out until it clicks.

3 While pressing the green button, set POWER to CAMERA.

4 Slide STANDBY up.

5 Turn the viewfinder lens adjustment ring so that the display in the viewfinder screen comes into sharp focus.

(F-2)



Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working properly.

(F-2)

1 **Hold the camcorder as illustrated.**
Put your hand through the grip strap and check that your thumb can easily touch START/STOP.

2 **Make sure that the viewfinder is pulled out.**

3 **Remove the lens cap and clip it on the grip strap.**

4 **Set the recording mode/EDIT switch to LP or SP, according to the length of the programme to be recorded.**

5 **While pressing the green button, set the POWER to CAMERA.**

6 **Close the AUTO LOCK cover and turn the zoom lever downwards.**

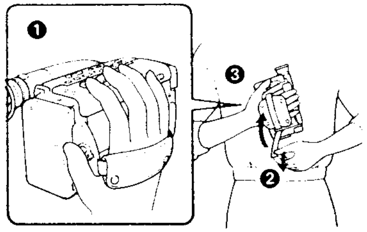
7 **Slide STANDBY up.**
"STBY" and the auto-focus frame appear in the viewfinder. The camcorder is now in the standby mode, and focus is adjusted automatically inside the frame (auto-focus adjusting range). Do not turn or stop the focus ring forcibly.

8 **Press START/STOP.**
"REC" appears and the red lamp lights up in the viewfinder. The camcorder is now recording.

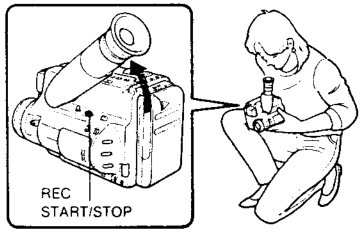
To pause (to stop momentarily)
Press START/STOP again.
"STBY" appears in the viewfinder. The camcorder is in the standby mode again.

To stop
Slide STANDBY down and set POWER to OFF.

(F-3)



(F-4)



How to fit the grip strap

(F-3)

In step 1 on the previous page, hold the camcorder against your body and pull the grip strap upward.

For low-position recording

(F-4)

The viewfinder can be turned 90 degrees up. It can be used in either the pushed-down or pulled-out position.

1 **Slide STANDBY up.**

2 **Press REC START/STOP with your left thumb.**

Notes on recording

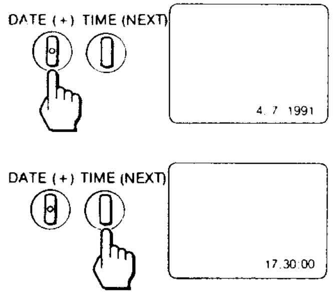
- To record from the beginning of the tape, run the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- If POWER is moved during recording, the tape will stop.
- When moving from indoors to outdoors, or vice versa, slide STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Note on the standby mode
If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will be turned off automatically. To resume the standby mode, slide STANDBY down once and slide it up again. To start recording, press START/STOP directly.

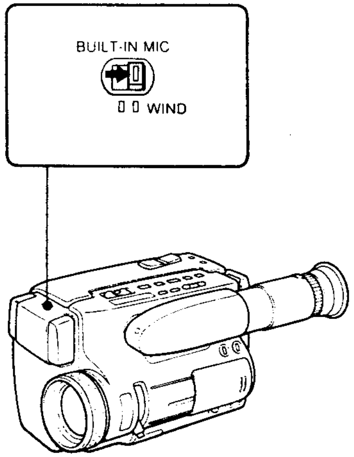
Recording mode
This camcorder records in the SP mode (approximately 20.051 mm/second) and in the LP mode (approximately 10.058 mm/second) and can play back in the SP mode and LP mode. The quality of the playback picture in the LP mode, however, will not as good as that in the SP mode.

Note on PCM recording and playback
PCM recording or playback is not possible with this camcorder. The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

(F-5)



(F-6)



To Record Date and Time

(F-5)

During camera recording or when in the recording pause mode, press DATE for date indication or TIME for time indication.
The date or time displayed in the viewfinder is recorded with the picture.

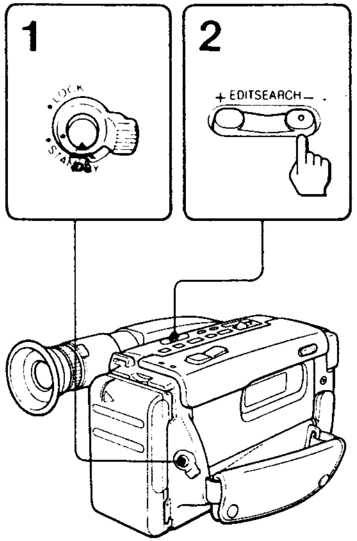
To stop recording date and time
Press DATE or TIME again.
The picture recording continues.

When There is a Strong Wind

(F-6)

Set BUILT-IN MIC to "WIND."
The noise from the wind (bass noise) will be reduced.
After recording, set it to the green position (green mark).
If you forget to do this, sound may be recorded unnaturally because of this function.

(F-7)



To Check the Last Portion of the Previous Recording

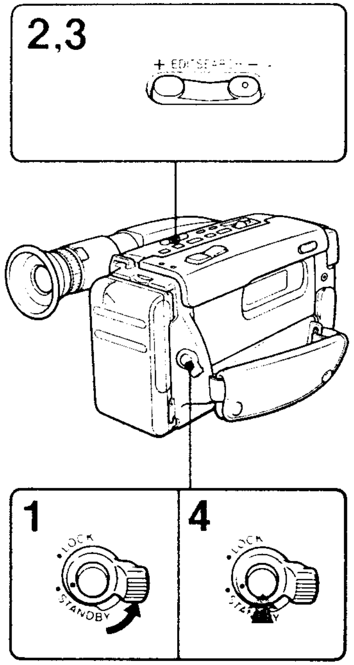
(F-7)

1 **Set the camcorder in the recording pause mode by pressing START/STOP.**

2 **Press—side of EDITSEARCH (⊖) momentarily.**
The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to the recording pause mode.

If the picture has not been recorded
The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(F-8)



To Re-record a Previously Recorded Portion

(F-8)

1 Slide STANDBY up to set the camcorder to the standby mode.

2 Look in the viewfinder and find the point from where you want to begin the recording by:
Keeping the + side of EDITSEARCH pressed to advance the picture at the normal playback speed, or the – side to reverse the picture playback.

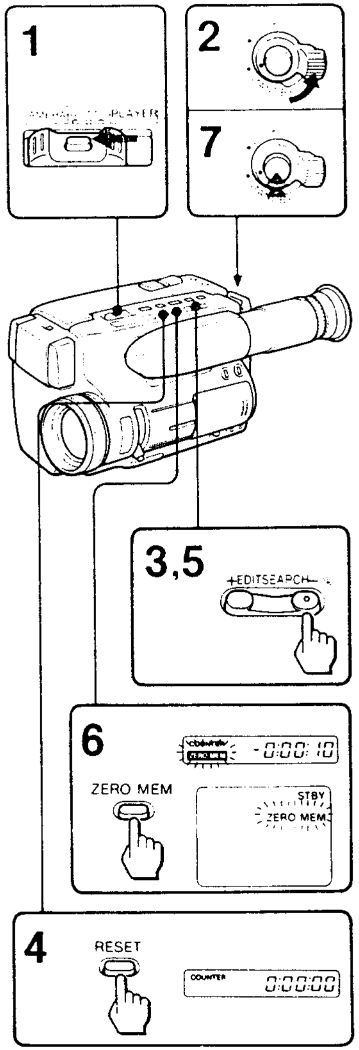
3 At the desired point, release EDITSEARCH.

4 Press START/STOP to start recording.

The picture is connected smoothly after the prerecorded portion even if STANDBY is slid down and up, or even if the power is turned off and on again, provided that the tape is not removed.

To stop
Slide STANDBY down.

(F-9)



To Re-record a Picture in the Middle of a Recorded Tape (Insert Recording)

(F-9)

1 While pressing the green button, set POWER to CAMERA.

2 Slide STANDBY up to set the camcorder to the standby mode.

3 While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.
The camcorder is set to the standby mode again.

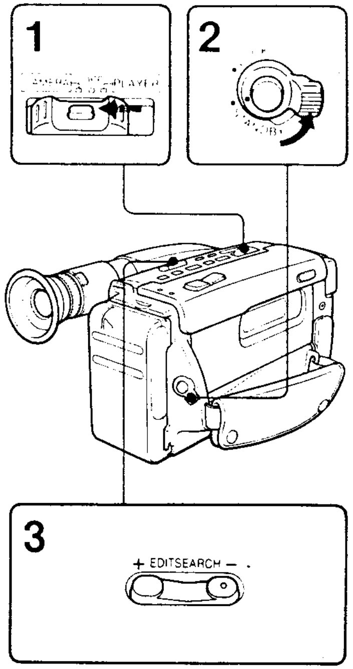
4 Press RESET.
The counter is reset to zero.

5 While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.

6 Press ZERO MEM.
The insert ending point is stored in memory.

7 Press START/STOP.
Insert recording begins, and stops automatically near the counter zero point.

(F-10)



Playing Back the Picture Instantly

(F-10)

You can check the recorded picture in the viewfinder. Sound is not heard.

1 **While pressing the green button, set POWER to CAMERA.**

2 Slide STANDBY up.

3 **Keep pressing the + or – side of EDITSEARCH to play back the picture.**
  - + **side:** to view the playback picture
  - – **side:** to view the playback picture in reverse

To stop playback
Release EDITSEARCH.

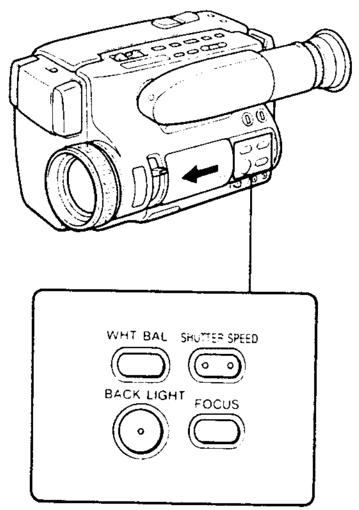
To monitor the sound while viewing the playback picture in the viewfinder
Connect headphones to the PHONES jack.

1 **While pressing the green button, set POWER to PLAYER.**

2 **Press ◀◀ to rewind the tape and press □ where you want to stop.**

3 **Press ▷ to start playback.**

(G-1)



Selecting the Automatic/Manual Adjustment

When you close the AUTO LOCK cover, the focus and white balance are adjusted automatically, and the shutter speed is set to 1/50.
The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, open the AUTO LOCK cover and select an appropriate setting.

What Each Button Does

(G-1)

WHT BAL:
Press to lock the white balance in the ☼ (outdoors), ⁘ (indoors), or HOLD mode. The tone of colours is fixed regardless of the lighting condition. (See page 36.)

SHUTTER SPEED:
Press to increase the shutter speed to record a fast-moving subject, such as a golf or tennis swing, clearly. (See page 38.)

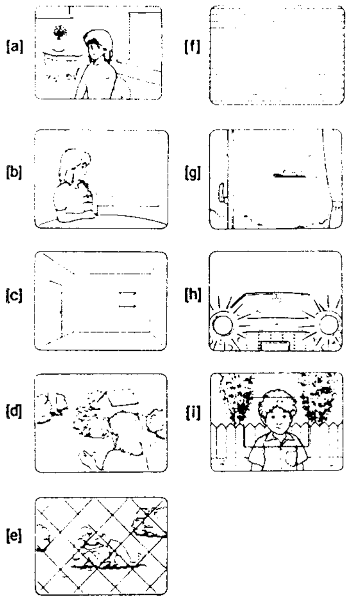
BACK LIGHT:
Press when a subject appears dark against a bright background. (See page 40.)

FOCUS:
Press to set the camcorder in the manual focusing mode.
Once the focus is adjusted manually, the setting is locked. (See page 34.)

Even if you open the AUTO LOCK cover
The setting of each button is the same as the automatic adjustment until you change it.

Notes
- Even when you set POWER to OFF, the previous settings are retained. They are cancelled if the power source is disconnected.
- If you close the AUTO LOCK cover after you have made manual adjustment and then open it again, the settings for manual adjustment will be recalled.

(H-1)



Manual Focusing

When you close the AUTO LOCK cover, the autofocusing functions and you can easily get a focused picture under most shooting conditions. But manual focusing is recommended in the following cases

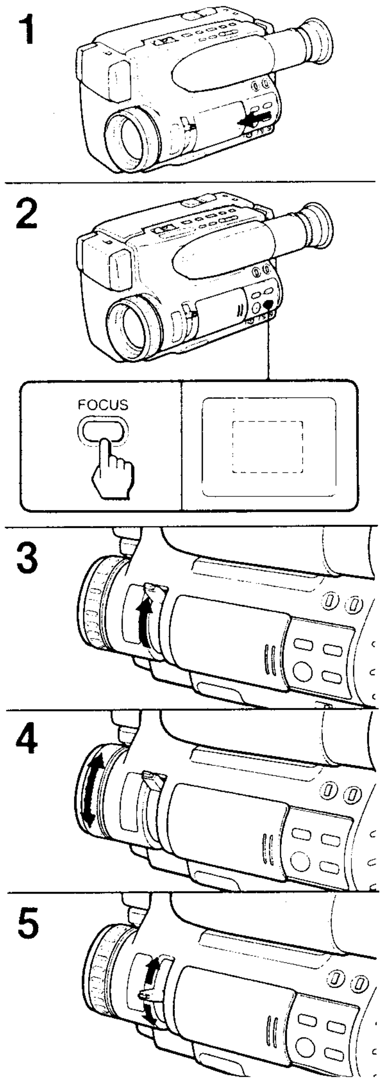
[a] to [j] correspond to the illustrations. (H-1)

- [a] Insufficient light
- [b] Too much brightness behind the subject
- [c] Subject with little contrast—wall, sky, etc.
- [d] One subject is close; the other is in the center, but at a distance
- [e] Subjects beyond nets, etc., or another subject passes in front of the camcorder
- [f] Horizontal stripes
- [g] Subject through frosted glass
- [h] Bright subject or subject reflecting light
- [i] High contrast behind the subject (the background may be focused)
- [j] Under the following circumstances
  - When using conversion lenses of effect filters
  - When shooting a stationary subject using a tripod
  - To save battery wear

Autofocusing does not function momentarily when:
- The setting of the shutter speed is changed.
- Back light is adjusted manually.
- Lighting conditions change quickly.
- Zooming is done from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(H-2)



Focusing Manually

(H-2)

1 **Slide open the AUTO LOCK cover.**

2 **Press FOCUS.**
Make sure that the autofocus frame goes off in the viewfinder.

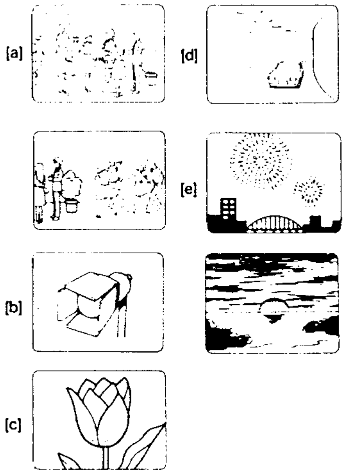
3 **Turn the manual zoom lever fully to the telephoto position.**

4 **Turn the focus ring to achieve sharp focus.**

5 **Set the desired shot length using the manual zoom lever.**

Some helpful hints
- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2m.

(I-1)



Adjusting the White Balance

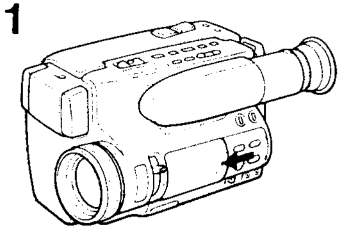
When you close the AUTO LOCK cover, the auto white balance function of this camcorder adjusts the picture to natural colours under most shooting conditions. However, in the conditions listed below, adjust the white balance manually.

[a] to [e] correspond to the illustrations **(I-1)**

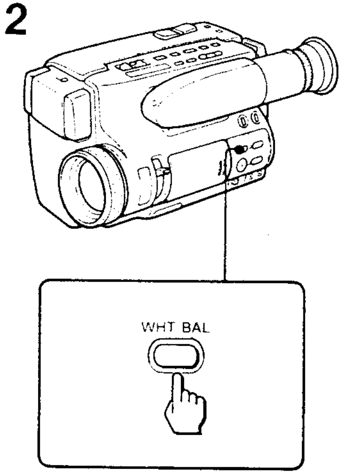
	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	☼
[b]	Too bright, such as in photograph studios	
[c]	Monochromatic subject or background	HOLD
[d]	Under sodium lamp	☼
	Under mercury lamp	
	Under a colour matching fluorescent lamp	☀
[e]	Recording: • a sunset/sunrise • after sunset • before sunrise e.g. neon signs, fireworks	

(I-2)

1



2



(I-3)

Colour temperature (K)		Light source
	10.000	Clear
	8.000	
Blue		Slightly overcast
	7.000	Cloudy, rainy
	6.000	Fluorescent lamp (daylight)
	5.000	
White		Direct sunlight
		Fluorescent lamp (daylight)
	4.000	1 hr. after/before sunrise/sunset
	3.500	Fluorescent lamp (off-white)
		Studio lamp
		Halogen lamp
	3.200	
	3.000	
Yellow		Tungsten lamp
	2.500	30 min. after/before sunrise/sunset
Red		
	2.000	Sunrise/sunset
		Candlelight

Adjusting the White Balance Manually

(I-2)

1 **Slide open the AUTO LOCK cover.**

2 **Select the desired white balance mode by pressing WHT BAL.**
Each time you press the button, the indication changes as follows

No indication (auto) → HOLD → ☀ → ☼
↑_______________________________|

What is the HOLD mode?
The HOLD mode allows you to film in natural colours by keeping light sources at a certain colour temperature. Initially the camcorder is in auto mode and is set to the appropriate white balance. When you set the camcorder to the HOLD mode, it will hold that temperature even if you record subjects with different light sources. You can record subject with natural colours without being affected by surroundings.

To set the HOLD mode

1 **Close the AUTO LOCK cover.**
The white balance will be set to the automatic mode.

2 **Point at a white, flat object such as a white wall or paper and record it for about 15 seconds.**

3 **Press WHT BAL to display the HOLD mark in the viewfinder.**
When you change the battery pack or when the light source is changed, follow this procedure again.

Colour Temperature and White Balance

(I-3)

The colour temperature indicates a property of light and is measured in K (Kelvin). It increases as the light source gets bluer and decreases as the light source gets redder. It has no direct relationship with brightness.
The camcorder automatically adjusts the white balance within the range shown below.

Setting the Shutter Speed

(J-1)

When a fast moving subject is recorded at normal shutter speed, it may not be seen clearly when played back in the pause mode (still picture). This can be improved by increasing the shutter speed. Six shutter speeds can be selected: 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/2000 or 1/4000 of a second. **(J-1)**

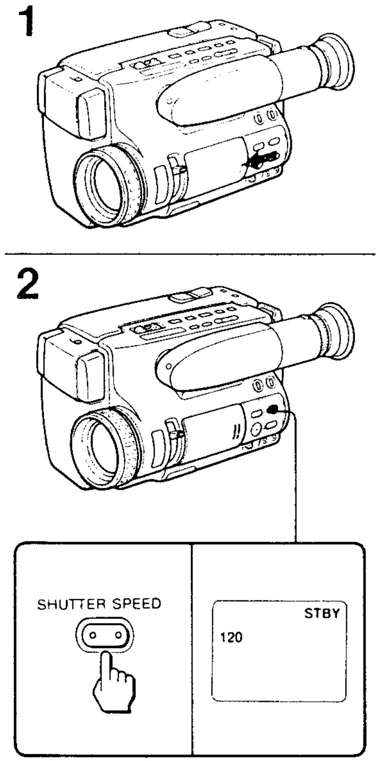
When recording at a high-speed shutter setting, record in a brighter place than usual. Also, the depth of field in proper focus becomes shallow at a higher shutter speed. This is effective to record the main subject in sharp focus and the surroundings out of focus.

Recommended setting for your situation
Choose an appropriate shutter speed according to the situation, referring to the chart for examples.

Example use	Recommended shutter speed
• On clear days, recording a golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000) • Recording skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or roller coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/100

When playing back the picture recorded at certain speeds
Use 8mm video equipment with the clean still function to obtain a noiseless still picture.

(J-2)



Selecting the Shutter Speed

(J-2)

1 **Slide open the AUTO LOCK cover.**

2 **Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.**
Each time you press the button, the indication changes as follows.

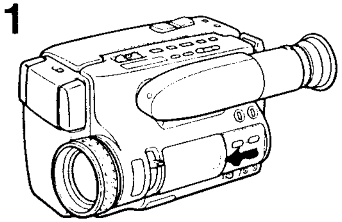
No indication (1/50) → 120 (1/120) → 250 (1/250)

4000 (1/4000) ← 2000 (1/2000) ← 1000 (1/1000)

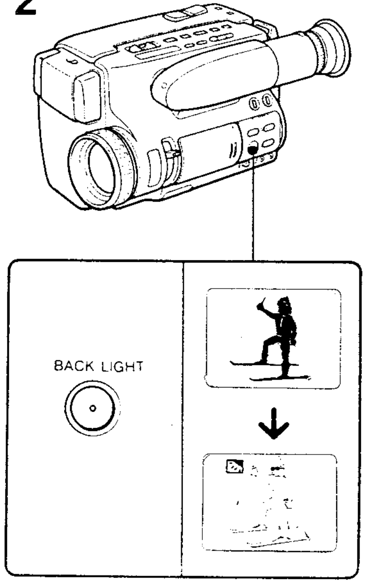
Notes
- When you select a shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a vertical light, belt-like line (smear) may appear on the screen.
- When you record at certain shutter speeds under a light discharges tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary (causing the picture to flicker).

(K-1)

1



2



Shooting with Backlighting

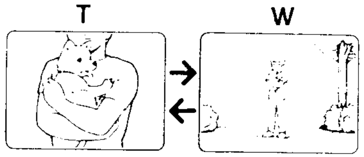
In this camcorder, the exposure is automatically controlled. However, if the light source is behind the subject, use BACK LIGHT (K-1)

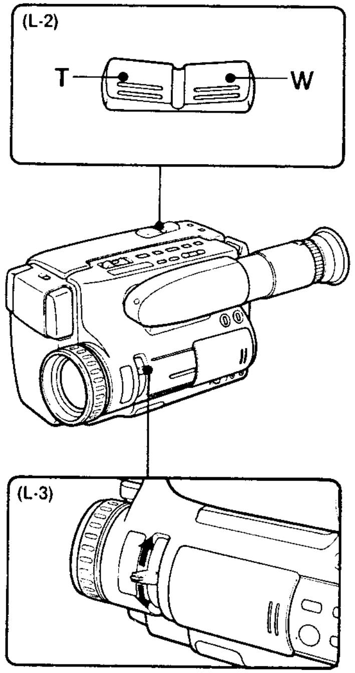
1 **Slide open the AUTO LOCK cover.**

2 Press BACK LIGHT.
   The ▨ indication appears in the viewfinder.

After shooting
Be sure to release this adjustment setting by pressing BACK LIGHT again.
(The ▨ indication goes out.)
Otherwise, the recorded picture will be too bright.

(L-1)





Zooming

The size of the subject in the screen can be changed. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. **(L-1)**

Power Zooming

— for smooth and constant zooming (L-2)

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Zooming Manually

— for creating a dramatic effect (L-3)

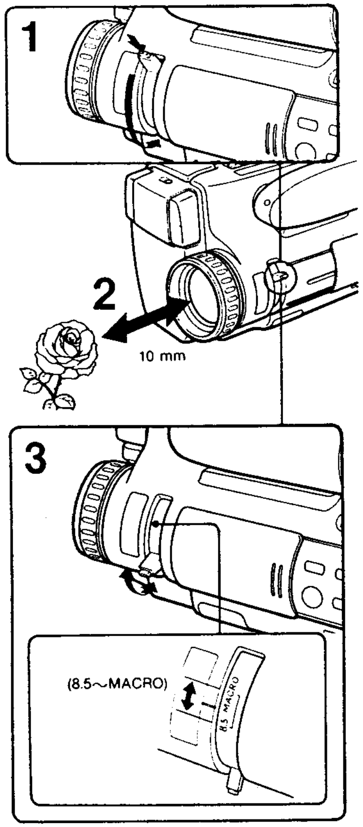
Turn the manual zoom lever upward for telephoto and downward for wide-angle.

Focal length of this camcorder
The focal length is 8.5 mm to 68 mm (1/3 to 2 3/4 inches). This means approximately 46 mm to 368 mm (1 13/16 to 14 1/2 inches) when converted into the focal length of a 35-mm camera.

For more zooming effect
Use an optional conversion lens VCL-0637 or VCL-1437.
If you use a 46 mm conversion lens, attach it using the supplied step-up-ring. Auto focus, however will not function in that case. For details, consult your Sony dealer.

When shooting with auto focusing
When you set the zoom lever to the wide angle position, the focus ring will be fixed around the 2 m position even though it may not exactly match the actual object-to-camera distance.

(M·1)



Close·Up (Macro)

Even tiny subjects, such as flowers, insects, and photographs, can literally fill the screen. (M·1)

1 **Turn the zoom lever to the MACRO position, pressing the green macro set button.**

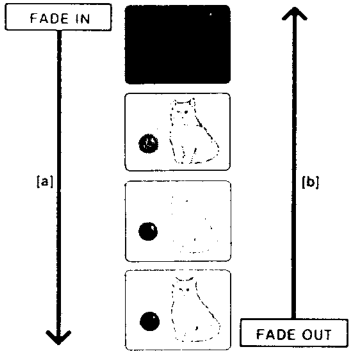
2 **Bring the camcorder as close as necessary to obtain the desired size of image.**
The subject can be as close as a minimum of 10 mm (7/16 in.) from the lens surface.

3 **Turn the zoom lever within the MACRO range to focus sharply.**

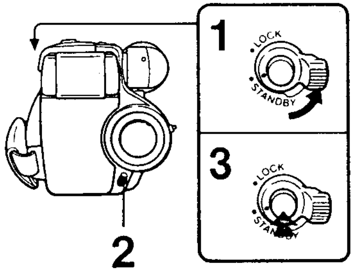
In the MACRO range, auto-focusing does not function.

Notes
- When shooting in macro, the depth of field is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.
- If the subject is closer than 10 mm (7/16 in.), it cannot be brought into focus.

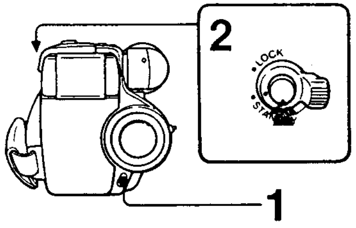
(N·1)



(N·2)



(N·3)



Fade·in and Fade·out

When fading-in, the picture will gradually appear from a black screen. The sound will also gradually increase.
When fading-out, the picture will gradually disappear to a black screen. The sound will also gradually decrease.
This function will give your recording a professional appearance. **(N·1)**

To Fade-in

(N·2)

1 **Slide STANDBY up to set the camcorder in the standby mode.**

2 **Press FADER.**
The "FADER" indication appears in the viewfinder.

3 **Press START/STOP.**
Fade-in is performed and then recording will start.

To Fade-out

(N·3)

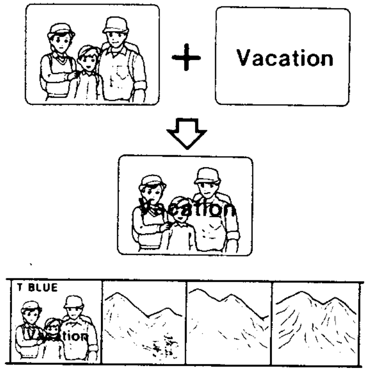
1 **While recording, press FADER.**
The "FADER" indication appears in the viewfinder.

2 **Press START/STOP to stop the recording.**
Fade-out is performed and then recording stops.

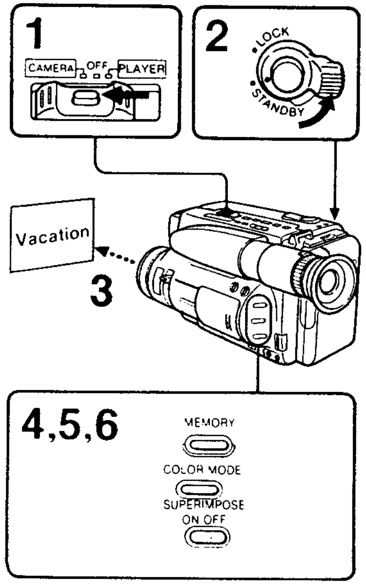
To cancel the fade-in/fade-out function before it is performed
Press FADER again before pressing START/STOP.

If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

(O-1)



(O-2)



Recording a Title

You can superimpose your own hand-lettered message or illustration over the picture during recording. **(O-1)**

- One title can be stored
- The colour of the title can be selected from 8 colours.

To make a desired title card, use a plain, white card and write a title using a dark colour and thick lines.

Before recording, store the title or illustration.

Storing a Title

(O-2)

Make sure that the lithium battery is installed.

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder in the standby mode.**

3 **Point the camcorder to the title card and adjust the focus.**
To focus the subject, use the close-up function if necessary.

4 **Press MEMORY to store the title.**

5 **Press COLOR/MODE and select the title colour.**
Each time you press the button the indication changes as follows.

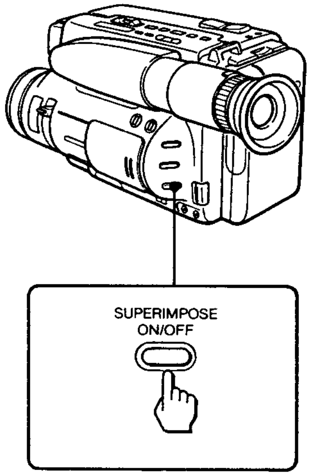
WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

6 **Press SUPERIMPOSE to turn off the title.**

To check the title
Press SUPERIMPOSE in the standby mode.
To turn off the title, press the button again.

About memory back up
The camcorder uses a lithium battery (located on the bottom of the unit) to keep the title in memory. On lithium battery life, see page 20.

(O-3)



Superimposing the Title on a Picture

(O-3)

1 **During recording, press SUPERIMPOSE at the point from which you want to insert the title.**
The title is displayed. During recording, the title is recorded.

2 **Wait for a while and at the point you want to turn off the title, press SUPERIMPOSE again.**
The title goes out.

When recording the title at the beginning
We recommend the following method:

1 **Set the camcorder in the standby mode.**

2 **Press SUPERIMPOSE.**

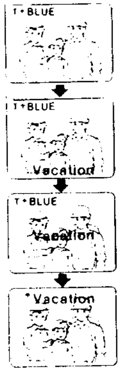
3 **Start recording with the title displayed in the viewfinder.**

4 **Wait for a while and at the point you want to turn off the title, press SUPERIMPOSE again.**

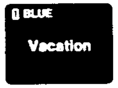
About the color indication

- The colour indication in the viewfinder is not recorded.
- You can change the title colour by pressing COLOR/MODE even after displaying the title.

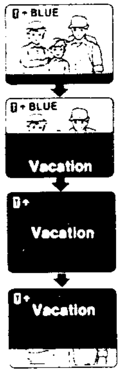
(O-4)



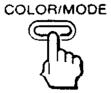
(O-5)



(O-6)



(O-7)



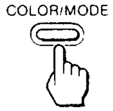
Various Display Modes of the Title

Display mode	Indication in the viewfinder
Scrolling up the title (O-4) The title scrolls up	↑
Reversing the title with the picture (O-5)	T
Scrolling up the reversed title (O-6)	T↑
Normal display mode	No indication

Selecting the display mode
Before displaying the title, press COLOR/MODE until the indication of the mode you want appears. (O-7)

After selecting the mode
Follow the procedure on page 45 to superimpose the title on the picture in that mode.

(O-8)



Function of the COLOR/MODE button

This button has a double function: one is to select the title colour and the other is to select the title display mode. Its function depends on whether the title is displayed or not. (O-8)

To select the colour

1 **Press SUPERIMPOSE to display the title.**

2 **Press COLOR/MODE.**
Each time you press the button, the colour indication changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN
↑
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

To select the mode

1 **If the title is displayed, press SUPERIMPOSE so that the title disappears.**

2 **Press COLOR/MODE.**
Each time you press the button, the mode indication changs as follows.

No indication (no title mode) → ↑ → T → T↑

↑ : Title scroll up mode
T : Title reverse mode
T↑ : Title reverse and scroll up mode

Connection for Playback

To view the playback picture on the TV screen, the camcorder and the TV and /or VTR must be connected properly. Check the following connecting examples and go to the appropriate section to make the connections required.
We recommend use of the AC power adaptor as a power source.

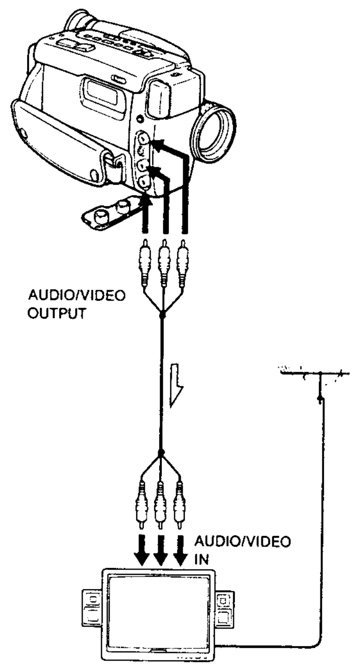
Types of Connections

Type 1: Connecting the camcorder to a TV with video/audio input jacks.

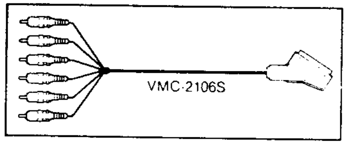
Type 2: Connecting the camcorder to a TV without video/audio input jacks.

Type 3: Connecting the camcorder to a TV via a VTR that has an input selector.

(P-1)



; Signal flow



Type 1: Connecting to a TV with Video/Audio Input Connectors

(P-1)

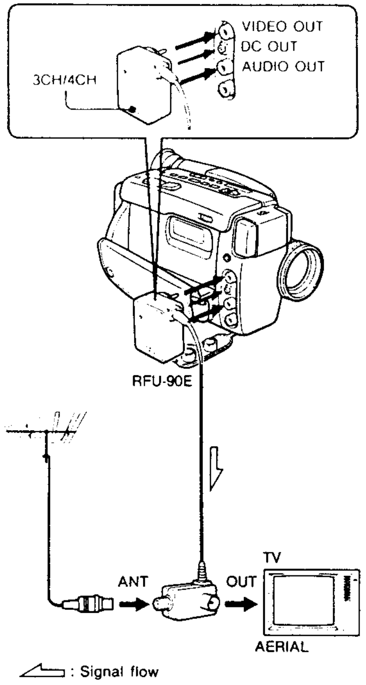
Leave the TV aerial cable connected to the TV.

1 **Connect the camcorder to the TV using an appropriate connecting cable (not supplied) to match the connectors on the TV.**
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV and set the Hi-Fi sound selector to the "green position." See "Selecting the Monitor Sound" on page 56.
- If your TV has a 21-pin connector (EUROCONNECTOR), use a connecting cable such as the VMC-2106M (not supplied).
- If your TV is a stereo type, the sound will be in stereo and when your TV is a monaural type, the sound will be in monaural.

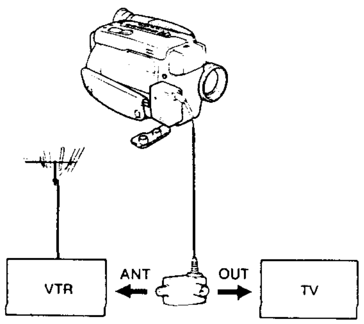
2 **Set the TV/VIDEO selector button on the TV to VIDEO.**

Note
For details on the TV, refer to the instruction manual of the TV.

(P-2)



(P-3)



Connection for Playback

Type 2: Connecting to a TV without Video/Audio Input Connectors

For the customers supplied with the RFU adaptor RFU-90E

Step 1

Connecting an RFU adaptor and a TV **(P-2)**
- Use the supplied RFU adaptor.
- Usually keep the RFU adaptor and the TV connected.

Step 2

Adjusting the TV
Adjust one of the TV programme position so that you can receive the picture and sound from the camcorder.

1 **Select the RF unit selector on the RFU adaptor to 3CH or 4CH, whichever is not active in your area.**

2 **Turn on the TV and select the 0 position.**

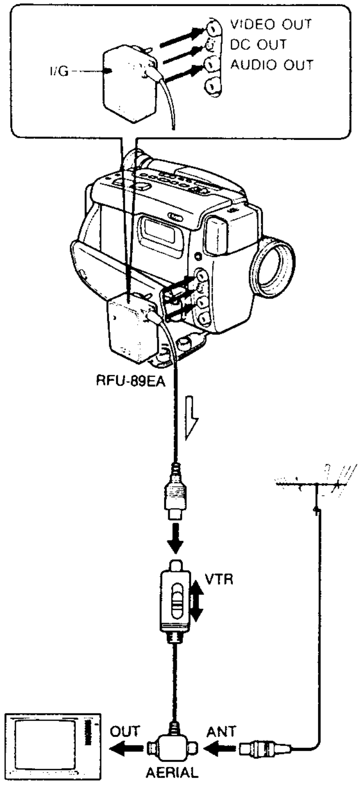
3 **Turn the TV so that you can get picture and sound from the camcorder.**

When you watch a TV programme
Turn off the camcorder or disconnect the RFU adaptor from the camcorder.

If your TV is connected with a VTR
Disconnect the aerial connection for the TV and the VTR. and insert the RFU adaptor between them. **(P-3)**

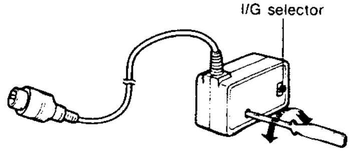
Note
The playback sound is monaural.

(P-4)



: Signal flow

(P-5)



Connection for Playback

For the customers supplied with the RFU adaptor RFU-89EA

Step 1

Connecting an RFU adaptor and a TV. **(P-4)**
- Use the supplied RFU adaptor.
- Usually keep the RFU adaptor and the TV connected.
- Set the selector switch on the aerial selector to VTR.

Step 2

Adjusting the TV
Adjust one of the TV programme position so that you can receive the picture and sound from the camcorder.

1 **Set the I/G selector on the RFU adaptor according to the TV system in your area.**

2 **Turn on the TV and select a programme position that is not used to receive a TV station.**

3 **Set the POWER switch of the camcorder to CAMERA and slide STANDBY up.**

4 **Tune the TV so that the picture and the sound from the camcorder is received.**

Note
For details on the TV, refer to the inctruction manual of the TV.

When the picture from the camcorder is not free of disturbance

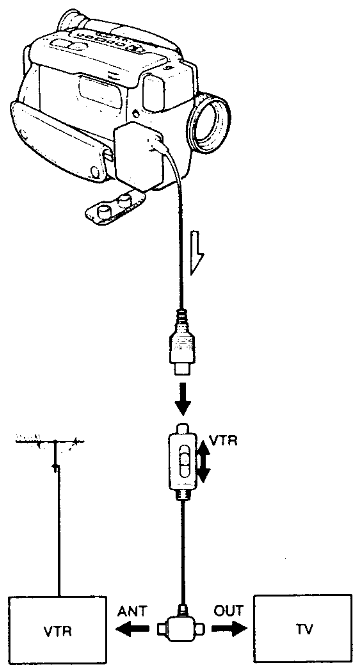
1 **Set the ANT/VTR selector on the aerial selector to ANT.**

2 **Select a programme position between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.**

3 **Set the ANT/VTR selector on the aerial selector to VTR.**

4 **Turn the screw on the RFU adaptor slowly with the supplied screwdriver so that the picture from the camcorder is clearly displayed on the TV screen. (P-5)**

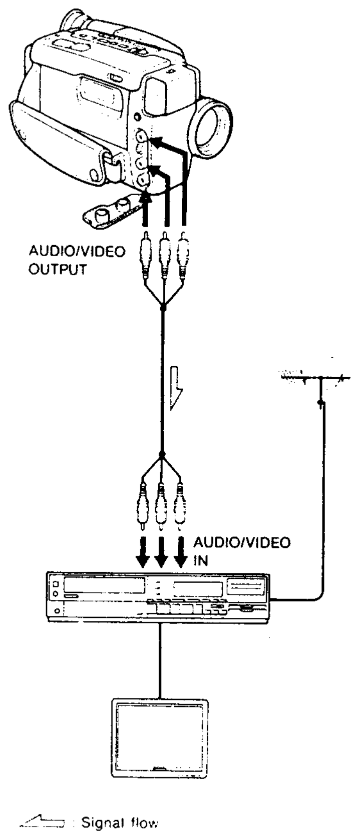
(P-6)



If your TV is connected to a VTR (P-6)
Connect the camcorder to the VTR instead of the TV.

Note
The playback sound is monaural

(P-7)



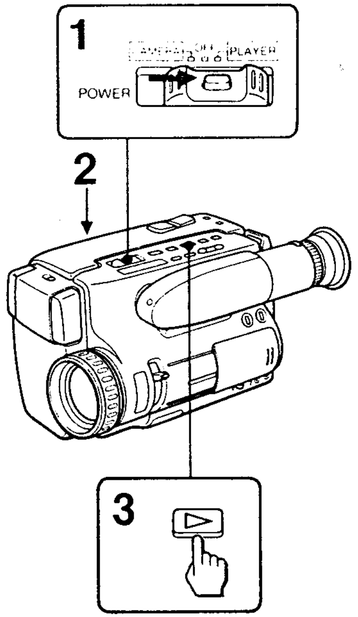
Type 3: Connecting to a TV via a VTR with an Input Selector

(P-7)

1 **Connect the camcorder to the VTR using an appropriate connecting cable (not supplied) to match the connectors on the VTR.**
- If your VTR is a monaural type, connect only the white plug for audio both on the camcorder and the VTR and set the Hi-Fi SOUND selector to the "green position." See "Selecting the Monitor Sound" on page 56. The monaural sound will be heard.
- If your VTR has a 21-pin connector (EUROCONNECTOR), use a connecting cable such as the VMC-2106M (not supplied).
- You will have stereo sound if your TV and VTR are stereo, however if one is monaural the sound will be monaural.

2 **Set the input selector on the VTR to LINE and set the TV/VTR selector on the TV to VTR.**

(Q-1)



Playing Back a Tape

Turn on the TV, and select the channel for viewing a playback picture (set the TV/VTR selector to VTR).

(Q-1)

1 **While pressing the green button, set the POWER switch to PLAYER.**

2 **Insert a tape.**

3 **Press ▷.**
Playback starts.

To view a still picture
Press :: during playback.
To resume playback, press :: or ▷ again.

To stop playback
Press □.

To rewind the tape
Press ◀◀.

To advance the tape rapidly
Press ▶▶.

Note
Streaks will appear and sound will be muted in the still picture mode.

Monitoring a High-Speed Picture

During playback—Picture search

1 **In the playback mode, press ◀◀ or ▶▶.**
The picture will be monitored at high speed as long as ◀◀ or ▶▶ is kept pressed.

2 **Release ◀◀ or ▶▶ at the desired point.**
Normal playback will resume.

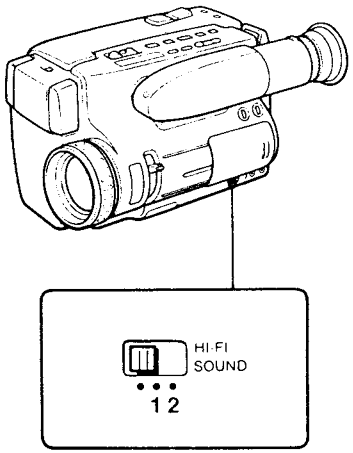
During fast-forward or rewind – Skip scan

1 **In the fast-forward or rewind mode, press ◀◀ or ▶▶.**
The picture is monitored as long as ◀◀ or ▶▶ is kept pressed.

2 **Release ◀◀ or ▶▶ to resume the normal fast-forward or rewind mode.**

Notes
- If you move the position of POWER during playback, the tape will stop. When you move POWER to CAMERA in the playback pause mode, however, the camcorder will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the camcorder will automatically enter the stop mode.

(Q-2)



Selecting the Monitor Sound

(Q-2)

The playback sound can be selected with the HI-FI SOUND switch.

When playing back a Hi-Fi stereo sound recorded tape
Set the switch to "Green position."

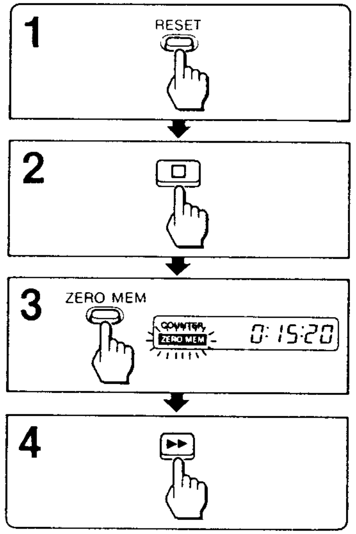
When playing back an AFM monaural sound recorded tape
Set the switch to "Green position." Monaural sound comes from the both audio jacks.

When playing back a dual sound recorded tape
Set the switch to " 1 " or " 2 ."

(R-1)

COUNTER
1:23:45

(R-2)



Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual tape position. **(R-1)**

To Index the Whole Tape

Press RESET at the beginning of the tape so that the counter shows "0:00:00."
Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

To Return to a Pre-registered Point During Playback

(R-2)

1. **During playback, press RESET at the point you later want to locate.**
   The counter will show "0:00:00."
2. **Press ◻ when the playback has finished, as usual.**
3. **Press ZERO MEM.**
   The "ZERO MEM" indicator blinks in the display window.
4. **Press ◄◄ or ►►.**
   The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

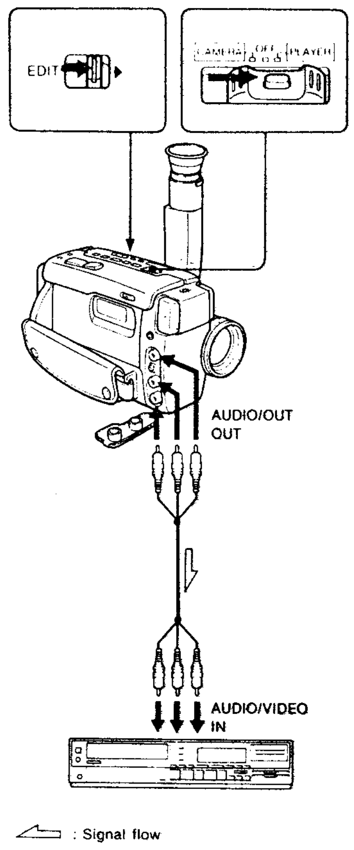
To return to a pre-registered point during recording

1. **During recording, press RESET at the point you later want to locate.**
2. **After recording, press START/STOP to enter the standby mode.**
3. **Slide down STANDBY.**
4. **While pressing the green button, set the POWER switch to PLAYER.**
5. **Press ZERO MEM.**
6. **Press ◄◄.**
7. **Press ▷ .**

Notes on the tape counter and ZERO MEM

- The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back a tape recorded in LP and SP modes mixed.
- Be sure to press the ZERO MEM after you stop the tape. It does not function during recording or playback.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point you pre-registerd.

(S)



Editing onto Another VTR

You can create your own video program by editing with any other ⑧ 8 mm, β Betamax or VHS VHS VTR.

Before You Begin

- Make connections using the appropriate audio/video connecting cable (not supplied) (S)
- Set the input selector of the VTR to LINE, if available.

Operation

1 **Insert a tape to be recorded on into the recording VTR.**

2 **Move EDIT on the camcorder in the direction of the arrow. (EDIT ON)**

3 **Set POWER of the camcorder to PLAYER and insert your recorded tape.**

4 **Playback the tape on the camcorder and locate the point where you want to start editing and set the camcorder to the playback pause mode.**

5 **On the recording VTR, locate the recording start point and set the VTR to the recording pause mode.**

6 **Press ⏸ on both units simultaneously to start editing.**

To stop editing momentarily
Press ⏸ on the recording VTR.

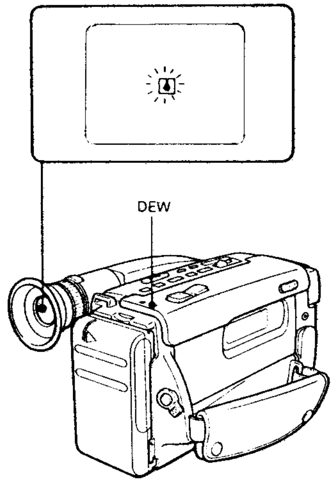
To edit more scenes
Repeat steps 4 to 6.

To stop editing
Press ⏸ on both units.

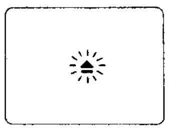
Use of the EDIT switch
When you set EDIT to the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to the minimum.

Notes
- Avoid using the edited tape for multiple generations of editing.
- After editing, move EDIT in the opposite direction of the arrow (EDIT OFF).

(U-1)



(U-2)



Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensor. However, take the following precautions.

If moisture condenses inside the unit (U-1)
Moisture is present inside the camcorder when the ▣ indication in the viewfinder blinks. ⏏ indication also blinks when the cassette is inserted. In this case, no function except for tape ejection will work.
Eject the tape, turn off the camcorder, and leave it with the cassette holder open for about 1 hour.
The camcorder can be used again if the ▣ indication does not appear when the power is turned on again.

If moisture condenses on the surface of the tape (U-2)
If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (▷, ▶▶, etc.) is pressed, the ⏏ indication blinks inside the viewfinder. In such case, no function except for tape ejection will work.
Eject the tape and let it sit for about 1 hour.
The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens
No indications will appear, but the picture becomes dim. Turn off the power and leave the camcorder unused for about 1 hour.

(U-3)

Notes and Precautions

Notes on Video Head Cleaning

To ensure clear picture, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated. (U-3)

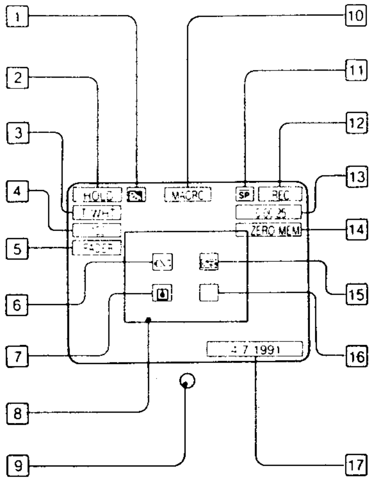
[a] Slight contamination
[b] Critical contamination
In such cases,

1. **Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.**
2. **After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.**
3. **If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)**

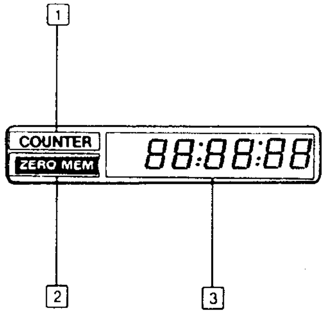
Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

(V-1)



(V-2)



Indications Inside the Viewfinder and the Display Window

Inside the Viewfinder

(V-1)

1. BACK LIGHT is pressed.
2. White balance mode (☀ / ☀ /HOLD)
3. Title mode
4. Shutter speed
5. FADER is pressed.
6. "Replace battery."
7. Moisture condensation.
8. Auto focus adjusting range
   Goes out during manual focusing
9. Shows up during recording.
   When blinking: "Replace battery."
10. In the MACRO range
11. Recording/Playback mode (LP/SP)
12. Tape transport and camera recording mode
13. Tape counter
14. ZERO MEM is pressed.
15. "Exchange tape."
16. "Clean video heads." or other caution (⊗, ⏏)
17. Date or time

Display window

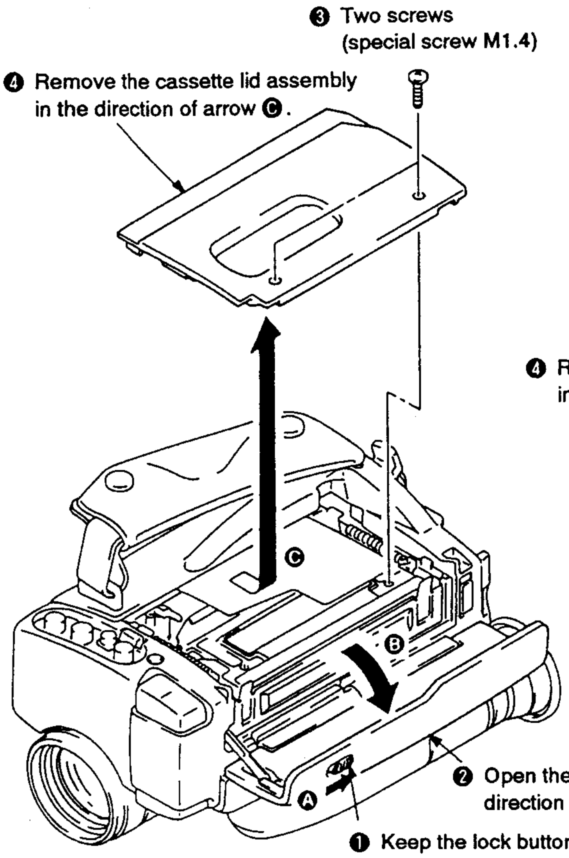
(V-2)

1. Tape counter
2. ZERO MEM is pressed.
3. Date or time/tape counter

SECTION 2

DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSEMBLY



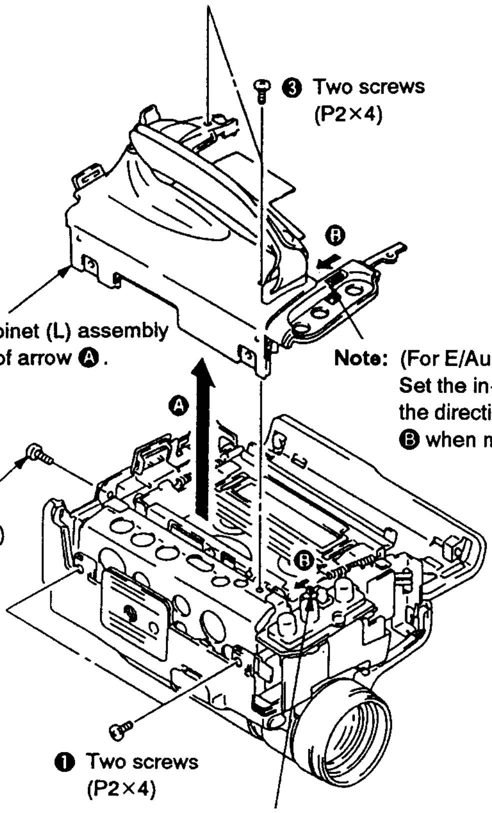
❶ Keep the lock button setting in the direction of arrow Ⓐ.

❷ Open the grip lid in the direction of arrow Ⓑ.

❸ Two screws (special screw M1.4)

❹ Remove the cassette lid assembly in the direction of arrow Ⓒ.

2-3. REMOVAL OF CABINET (L) ASSEMBLY



❶ Two screws (P2×4)

❷ Screw (P2×4)

❸ Two screws (P2×4)

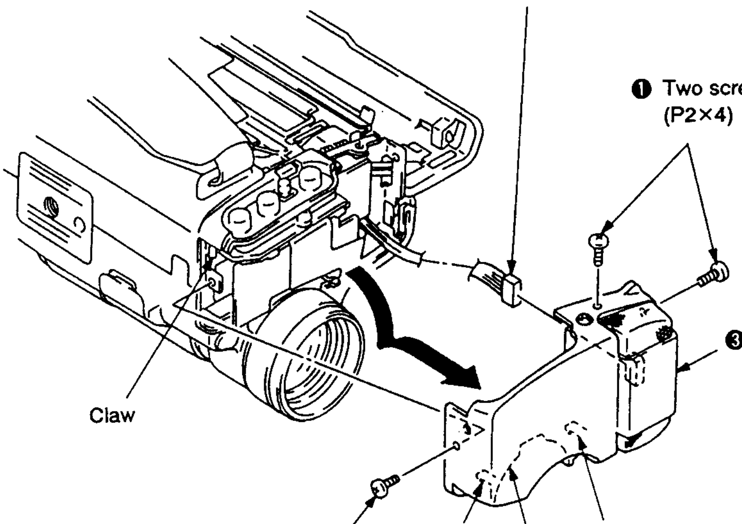
❹ Remove the cabinet (L) assembly in the direction of arrow Ⓐ.

Note: (For E/Australian model only) Set the in-out knob in the direction of arrow Ⓑ when mounting.

Note: (For E/Australian model only) Set the slide switch in the direction of arrow Ⓑ when mounting and confirm that the in-out knob slides after fiting.

Note: (For AEP/UK model only) Set the slide switch in the direction of arrow Ⓑ (out put side) when mounting,

2-2. REMOVAL OF F PANEL ASSEMBLY



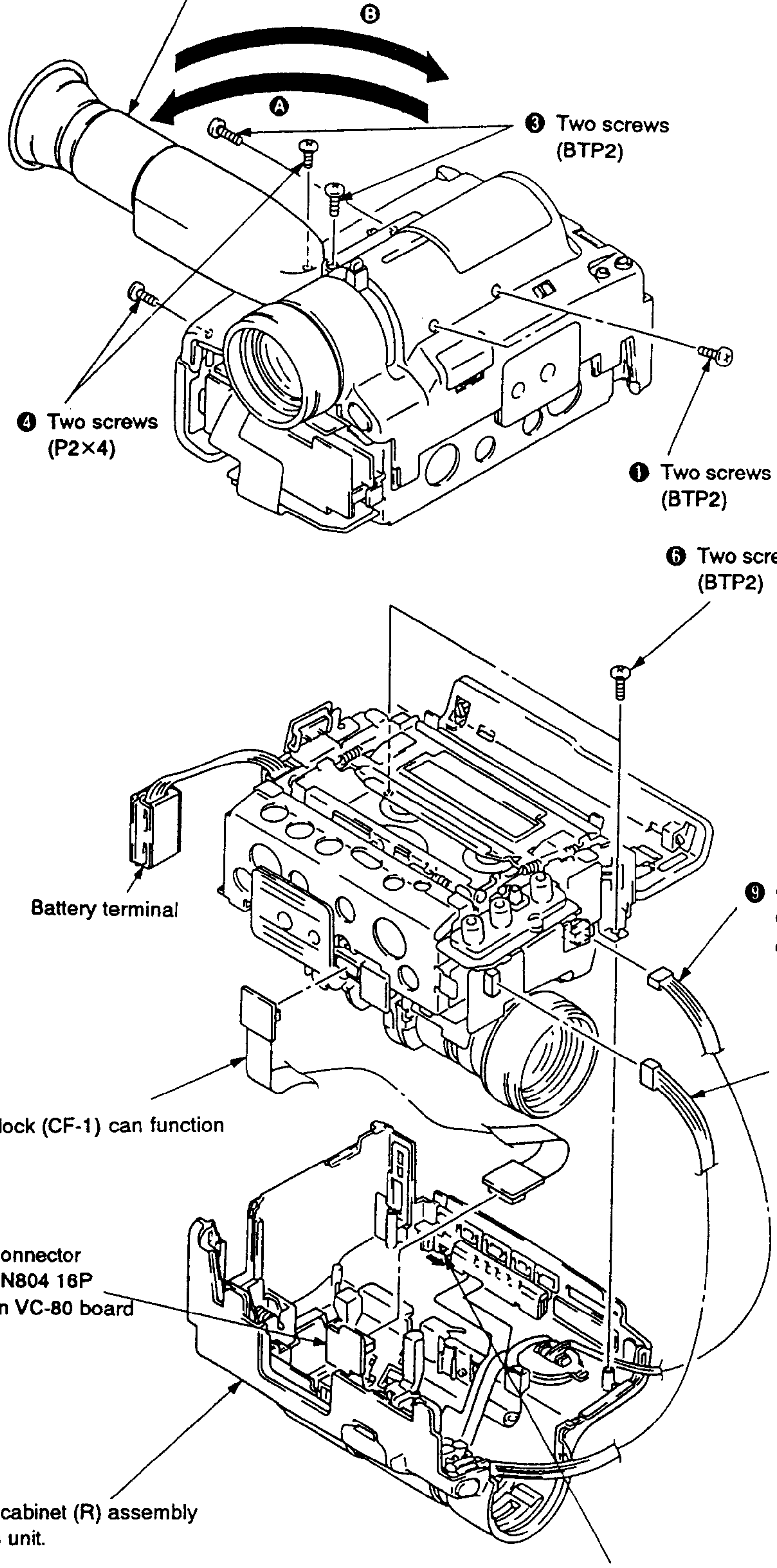
❶ Two screws (P2×4)

❷ Screw (P2×4)

❸ Remove the F panel assembly in the direction of arrow. (Since the rib touch the lens section, remove as turning in the direction of the cabinet (R).)

❹ Connector CN403 5P on MA-65 board

2-4. REMOVAL OF CABINET (R) ASSEMBLY



❺ Move the EVF assembly in the direction of arrow Ⓑ and return on the place where it was.

❷ Move the EVF assembly in the direction of arrow Ⓐ.

❸ Two screws (BTP2)

❹ Two screws (P2×4)

❶ Two screws (BTP2)

❻ Two screws (BTP2)

Battery terminal

❾ Connector CN205 4P on VS-67 board

❿ Connector CN803 5P on AU-86 board

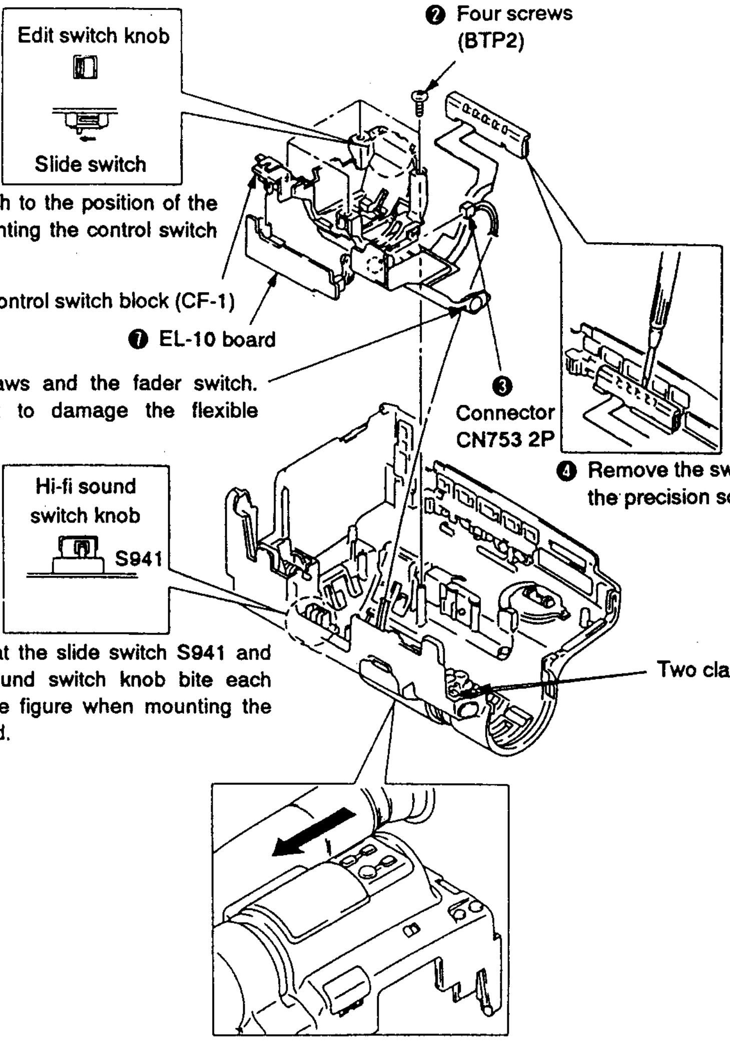
J-6082-062-A
- The control switch block (CF-1) can function by using this jig.

❽ Connector CN804 16P on VC-80 board

❼ Separate the cabinet (R) assembly from the main unit.

Note: (For E/Australian model only)
Be sure to set the REC switch knob in the direction of arrow when mounting the cabinet (R) assembly.

2-5. REMOVAL OF CONTROL SWITCH BLOCK (CF-1)


Edit switch knob
Slide switch
Hi-fi sound switch knob
S941
Two claws

❷ Four screws (BTP2)

Note: Set the edit switch to the position of the figure when mounting the control switch block.

❻ Control switch block (CF-1)

❼ EL-10 board

❺ Remove two claws and the fader switch. (Take care not to damage the flexible board.)

❸ Connector CN753 2P

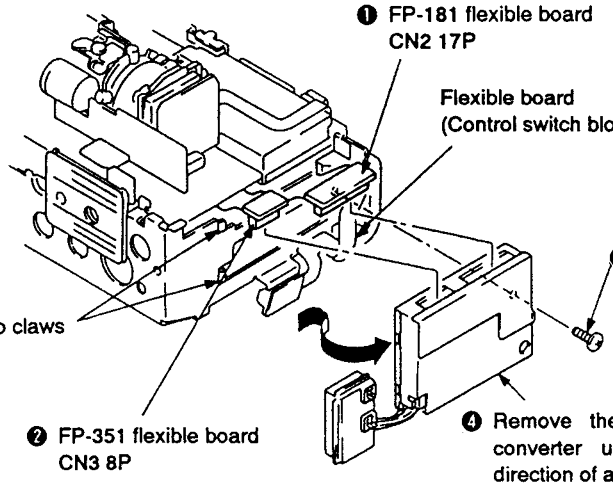
❹ Remove the switch section using the precision screw driver and so on.

Note: Be sure that the slide switch S941 and the hi-fi sound switch knob bite each other as the figure when mounting the EL-10 board.

❶ Move the slide lid in the direction of arrow.

2-6. REMOVAL OF DD-30 BOARD (DC-DC CONVERTER UNIT)

Note: Take care not to damage the flexible board of the control switch block (FK-1) when removing the DC-DC converter unit.


Flexible board (Control switch block (FK-1))
Two claws

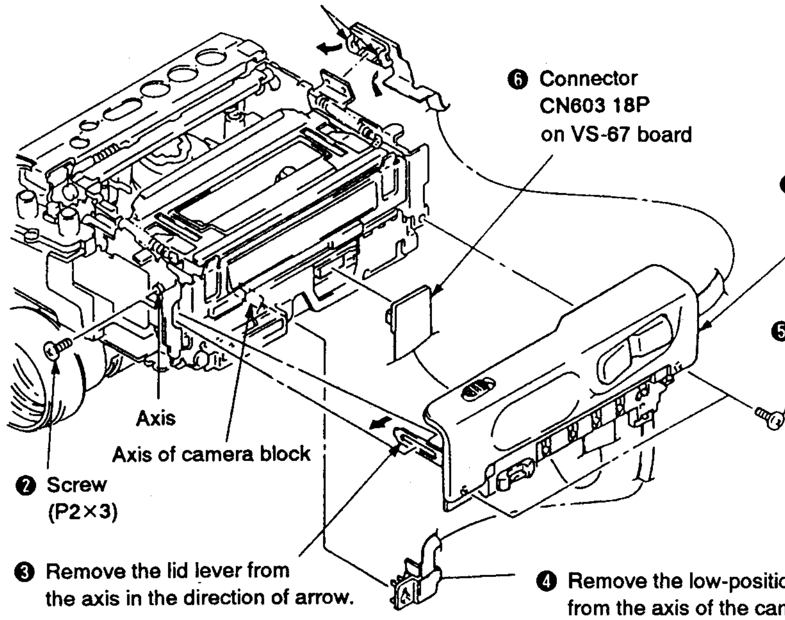
❶ FP-181 flexible board CN2 17P

❸ Screw (P2×3)

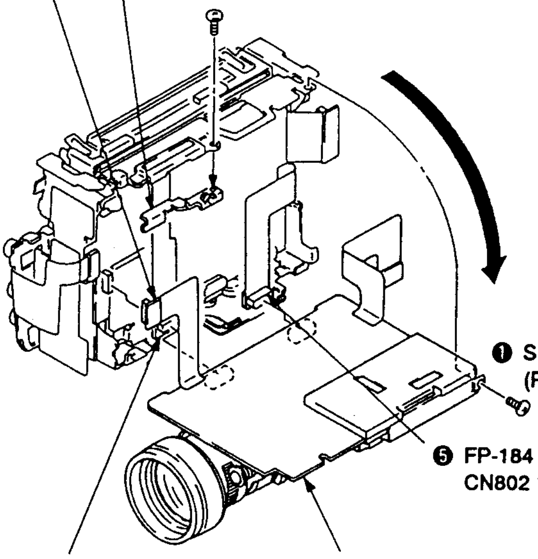
❷ FP-351 flexible board CN3 8P

❹ Remove the DD-30 board (the DC-DC converter unit) from two claws in the direction of arrow.

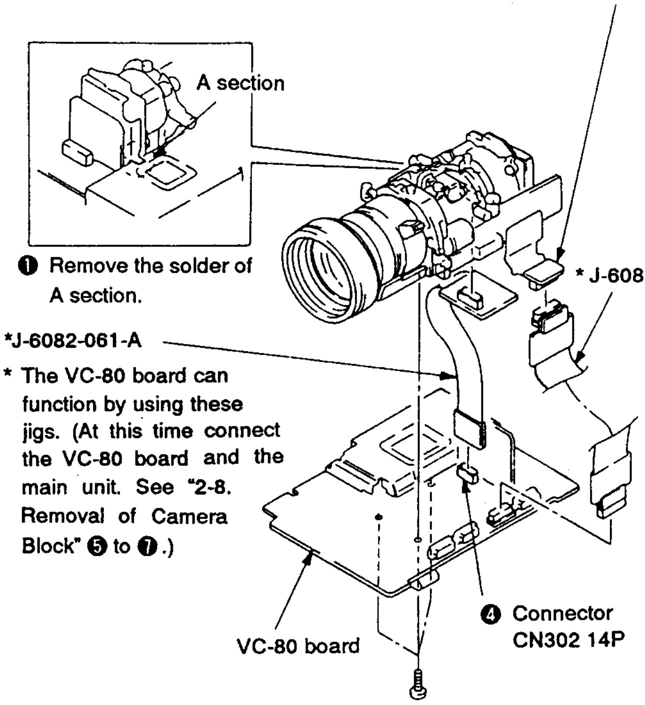
2-7. REMOVAL OF CONTROL SWITCH BLOCK (FK-1)


❶ Remove opening two claws in the direction of arrow.
❻ Connector CN603 18P on VS-67 board
❼ Control switch block (FK-1)
❺ Two screws (P2×3)
Axis
Axis of camera block
❷ Screw (P2×3)
❸ Remove the lid lever from the axis in the direction of arrow.
❹ Remove the low-position REC switch from the axis of the camera block.

2-8. REMOVAL OF CAMERA BLOCK (VC-80 BOARD)


❼ FP-362 flexible board CN202 7P on VS-67 board
❸ LCD reinforcement
❷ Screw (P2×3)
❶ Screw (P2×3)
❺ FP-184 flexible board CN802 16P on VC-80 board
❻ LC-11 flexible board CN806 18P on VC-80 board
❹ Open the camera block (VC-80 board) in the direction of arrow.

2-9. REMOVAL OF LENS ASSEMBLY



❸ FP-187 flexible board
CN805 20P on VC-80 board

A section

❶ Remove the solder of
A section.

* J-6082-063-B

*J-6082-061-A

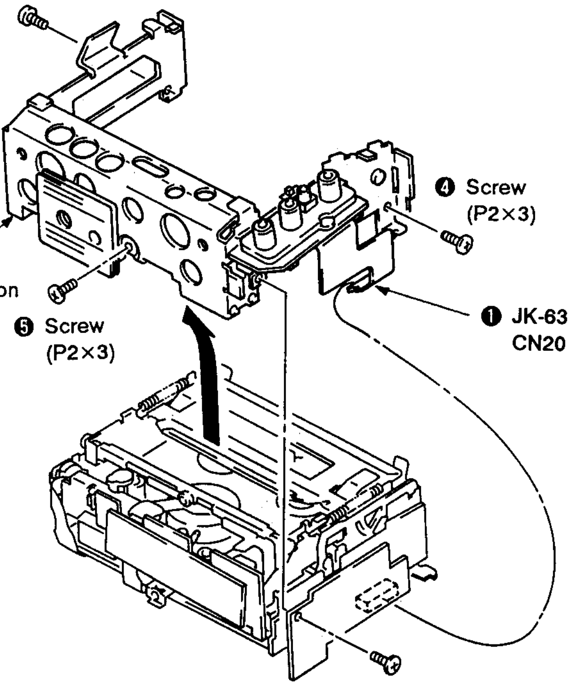
* The VC-80 board can function by using these jigs. (At this time connect the VC-80 board and the main unit. See "2-8. Removal of Camera Block" ❺ to ❼.)

VC-80 board

❹ Connector
CN302 14P

❷ Three screws
(BTP2×5)

2-10. REMOVAL OF MD FLAME ASSEMBLY



❸ Screw
(P2×3)

❹ Screw
(P2×3)

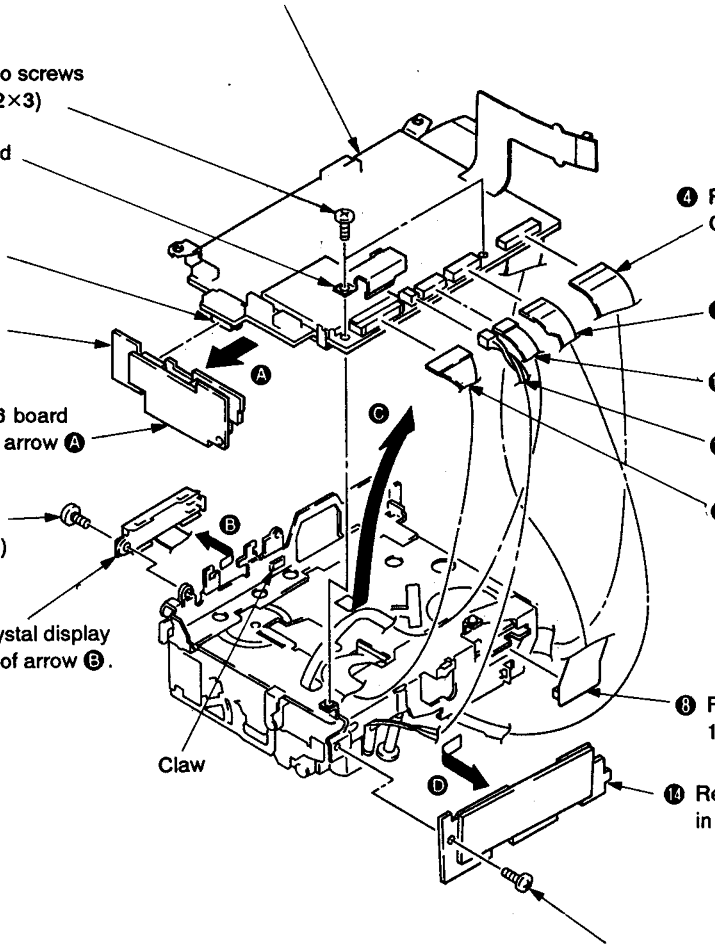
❻ Remove the MD flame assembly in the direction of arrow.

❺ Screw
(P2×3)

❶ JK-63 board (pin jack assembly)
CN201 10P on VS-67 board

❷ Screw
(P2×3)

2-11. REMOVAL OF VS-67 BOARD



⑦ Remove the VS-67 board from the claw and open in the direction of arrow Ⓒ.

⑤ Two screws (P2×3)

⑥ RP connector shield

Connector CN203 18P

AU-85 board

① Remove the AU-86 board in the direction of arrow Ⓐ

② Screw (P2×3)

③ Remove the liquid crystal display block in the direction of arrow Ⓑ.

④ FP-149 flexible board CN602 14P

⑨ DL-18 flexible board CN501 9P

⑩ FP-114 flexible board CN601 6P

⑪ Connector CN607 2P

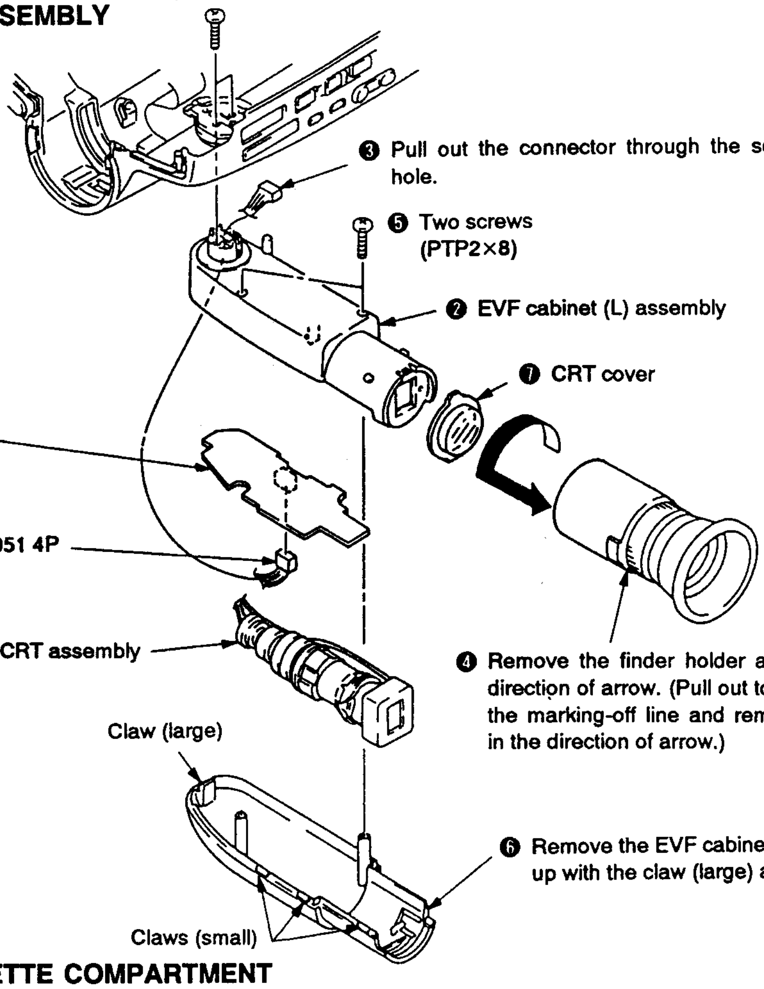
⑫ DL-17 flexible board CN101 15P

⑧ FP-182 flexible board 18P M902 capstan motor

⑭ Remove the PD-18 board in the direction of arrow Ⓓ

⑬ Screw (P2×3)

2-12. REMOVAL OF EVF ASSEMBLY



❶ Two screws (P2×10.5)

❸ Pull out the connector through the square hole.

❺ Two screws (PTP2×8)

❷ EVF cabinet (L) assembly

❼ CRT cover

❾ VF-40 board

❿ Connector CN951 4P

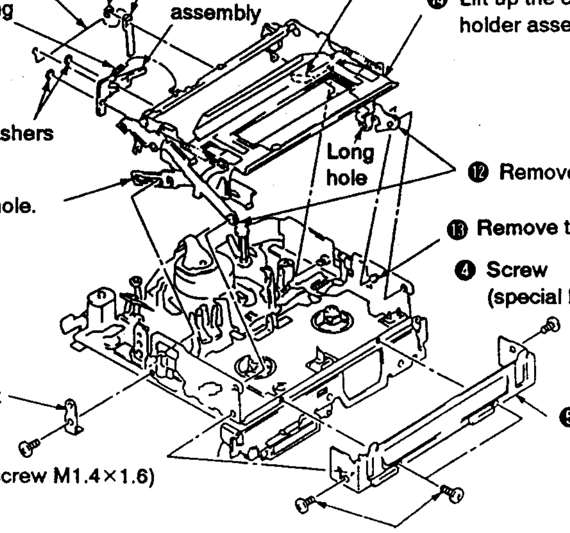
❽ CRT assembly

❹ Remove the finder holder assembly in the direction of arrow. (Pull out to the position of the marking-off line and remove by turning in the direction of arrow.)

❻ Remove the EVF cabinet (R) by lifting up with the claw (large) as its fulcrum.

2-13. REMOVAL OF CASSETTE COMPARTMENT HOLDER ASSEMBLY

Note: In the beginning set to USE mode.
(When setting to USE mode, see "1-4. Handling of Mode Selector" in "8 mm video mechanical adjustment manual II FL Mechanism (Q mechanism)".)



❻ Stopper washer

❽ T protector assembly

❼ Joint bar

⓫ TP arm block assembly

❿ Tension coil spring

⓯ Remove the axis from the long hole.

⓮ Lift up the cassette compartment holder assembly to the dram side.

❾ Two fastening washers

⓬ Remove the axis from the holes.

⓰ Remove the axis from the long hole.

⓭ Remove the axis from the long hole.

❹ Screw (special head screw M1.4×1.6)

❷ LS support

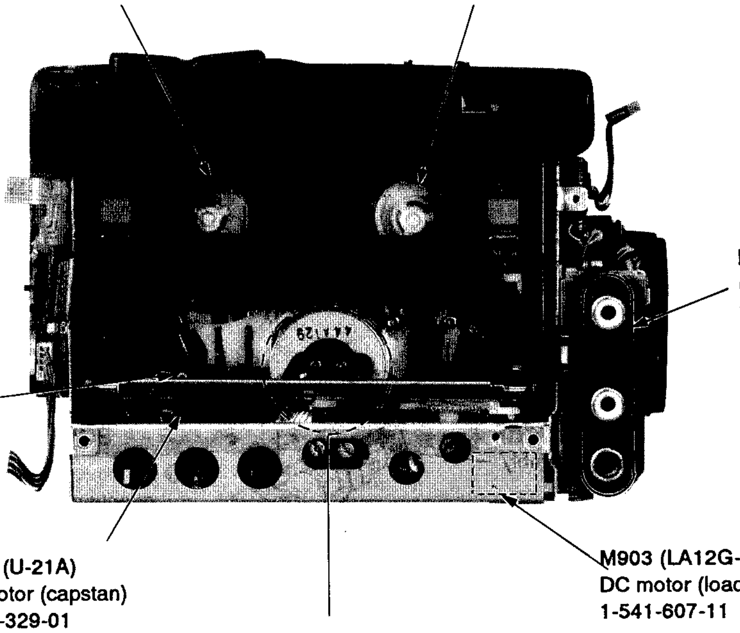
❺ LS flame (2)

❶ Screw (special head screw M1.4×1.6)

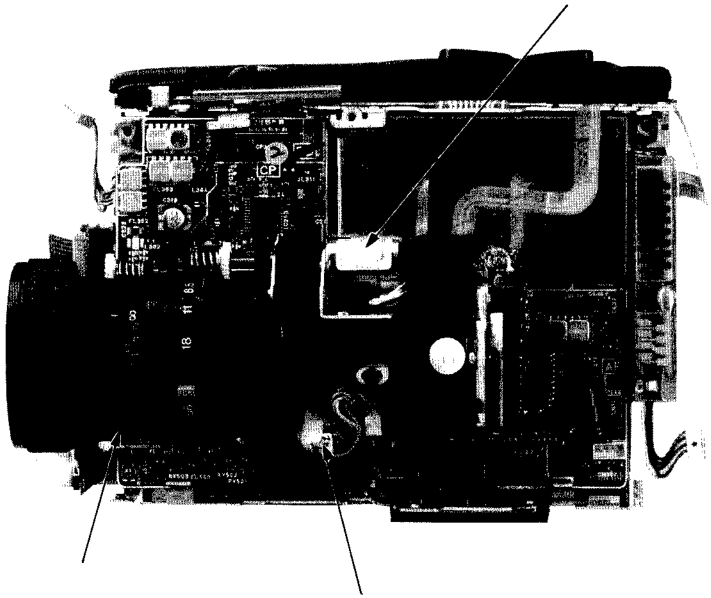
❸ Three screws (special head screw M1.4×1.6)

2-14. INTERNAL VIEWS

— Right side —

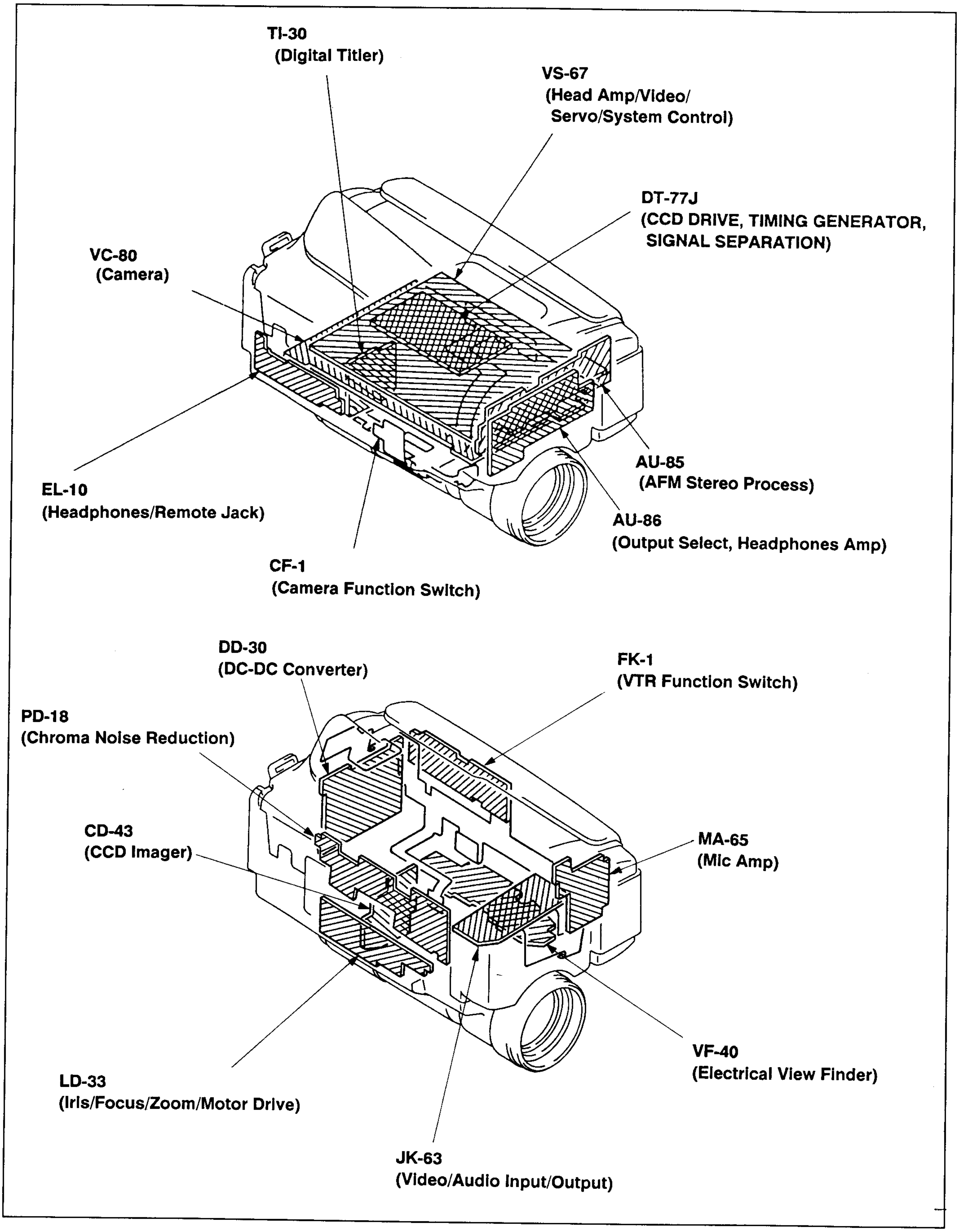

T reel table assembly
X-3727-951-2
S reel table assembly
X-3727-952-1
Pin jack 3P
(AUDIO/VIDEO input/output)
1-569-777-11
Pinch roller
M902 (U-21A)
DC motor (capstan)
8-835-329-01
M903 (LA12G-344VA)
DC motor (loading)
1-541-607-11
M901
Dram assembly (DGH-37A-R)
A-7048-214-A

— Left side —

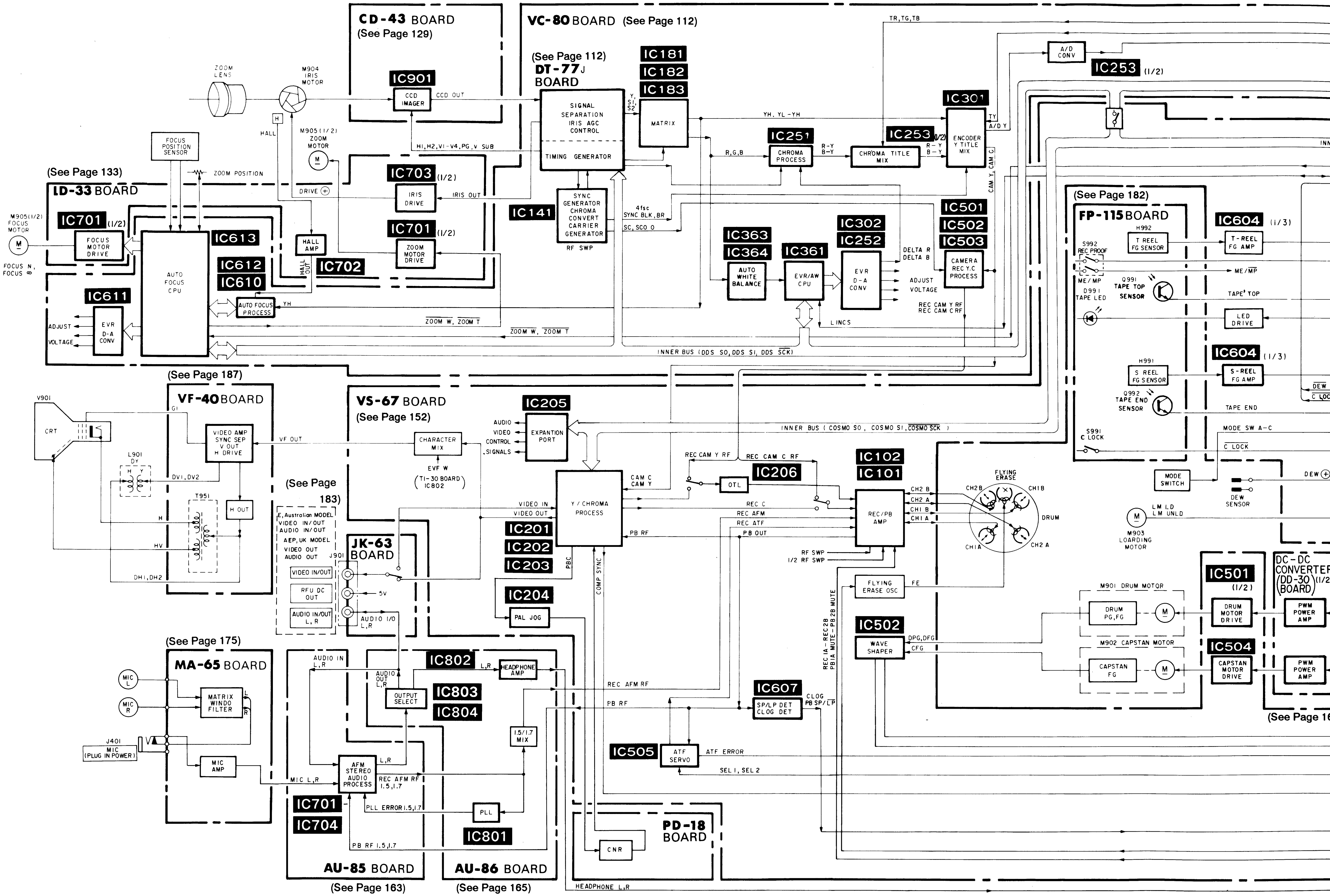

M905
Focus/zooming motor
3-707-994-01 (type CAN)
3-708-016-01 (type CHI)
Zoom lens
(VCL-8508XH) (type CAN)
1-547-419-11
(VCL-8508XI) (type CHI)
1-547-420-11
M904
Iris meter
3-708-018-01 (type CHI)

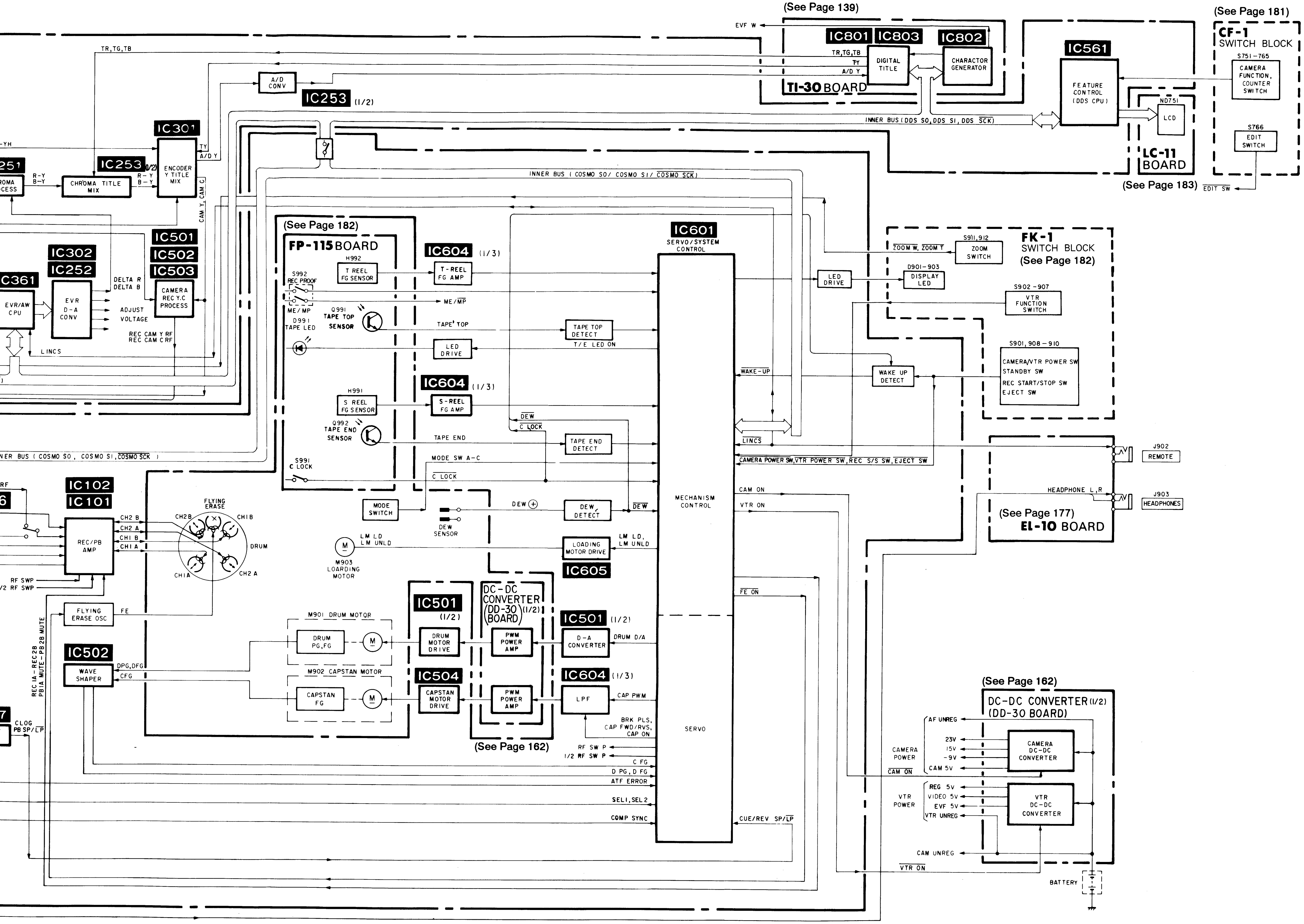
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

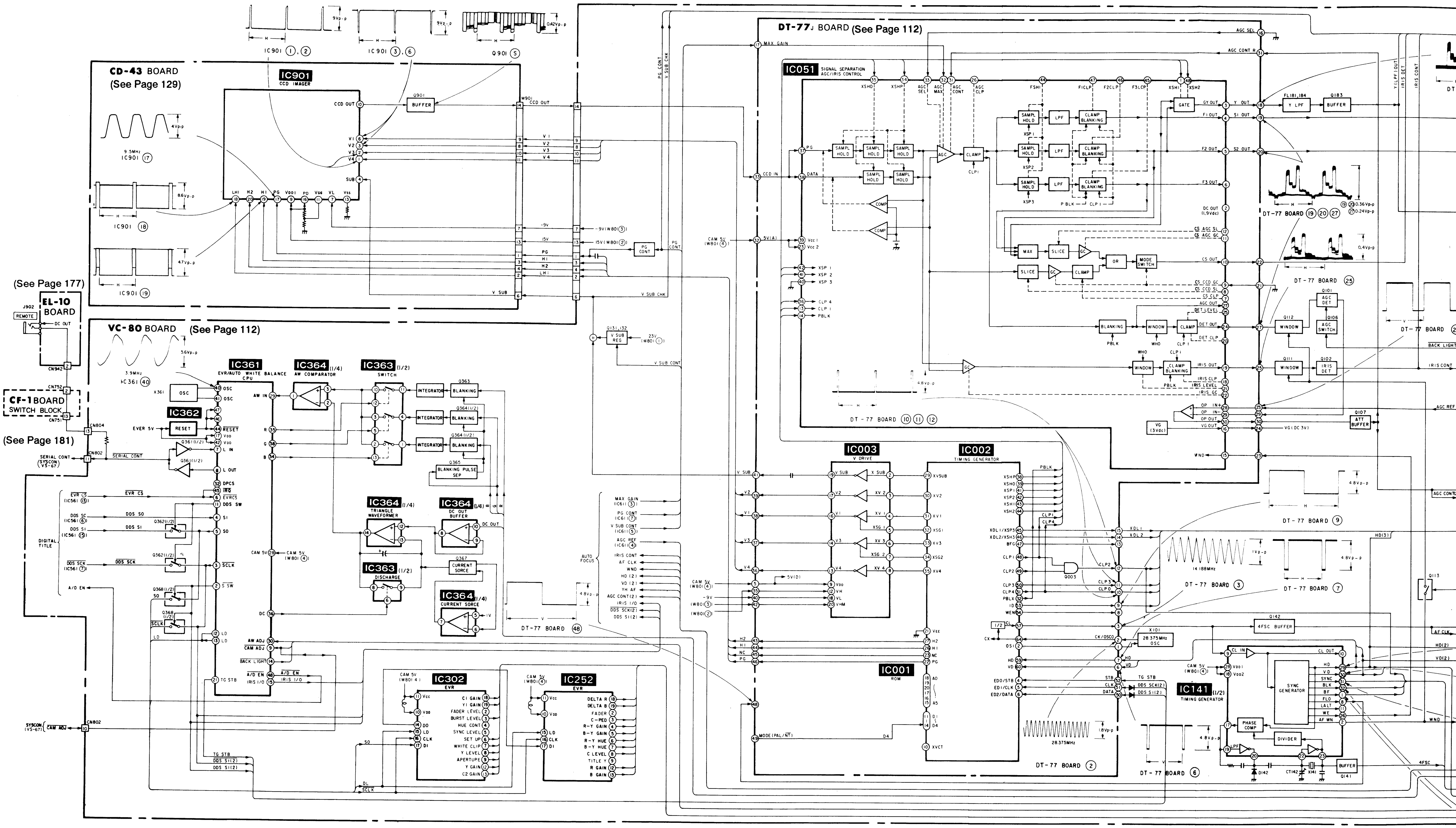

TI-30
(Digital Titler)
VS-67
(Head Amp/Video/
Servo/System Control)
DT-77J
(CCD DRIVE, TIMING GENERATOR,
SIGNAL SEPARATION)
VC-80
(Camera)
EL-10
(Headphones/Remote Jack)
AU-85
(AFM Stereo Process)
AU-86
(Output Select, Headphones Amp)
CF-1
(Camera Function Switch)
DD-30
(DC-DC Converter)
FK-1
(VTR Function Switch)
PD-18
(Chroma Noise Reduction)
CD-43
(CCD Imager)
MA-65
(Mic Amp)
LD-33
(Iris/Focus/Zoom/Motor Drive)
VF-40
(Electrical View Finder)
JK-63
(Video/Audio Input/Output)

3-2. OVERALL BLOCK DIAGRAM

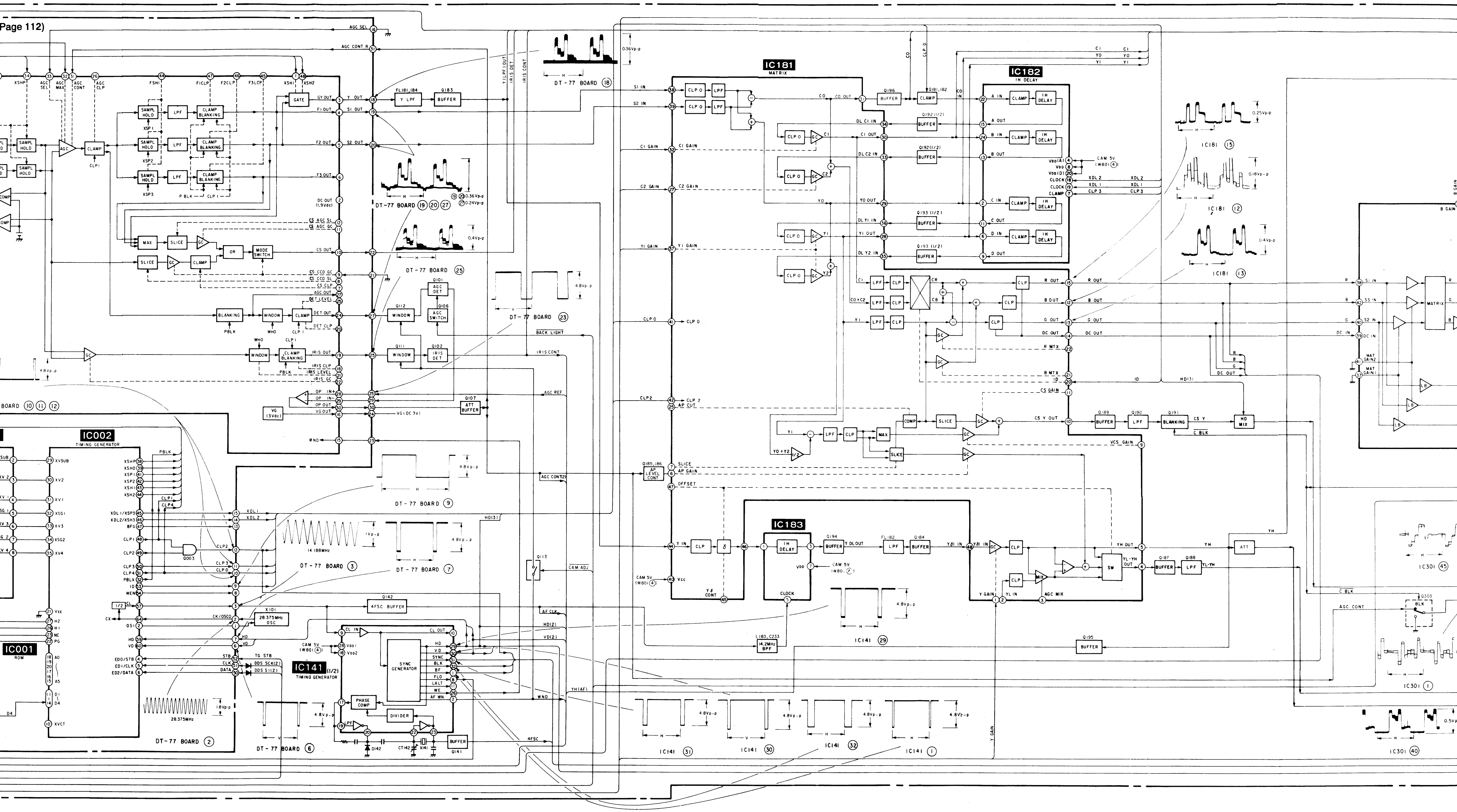

CD-43 BOARD
(See Page 129)
VC-80 BOARD (See Page 112)
(See Page 112)
DT-77J BOARD
ZOOM LENS
M904 IRIS MOTOR
IC901
CCD IMAGER
CCD OUT
IC181
IC182
IC183
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
MATRIX
Y, S1, S2
YH, YL-YH
TR, TG, TB
A/D CONV
IC253 (1/2)
IC301
ENCODER Y TITLE MIX
TY
A/D Y
IC251
CHROMA PROCESS
R,G,B
R-Y B-Y
IC253 (1/2)
CHROMA TITLE MIX
CAM Y, CAM C
FOCUS POSITION SENSOR
HALL
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
H1, H2, V1-V4, PG, V SUB
(See Page 133)
LD-33 BOARD
DRIVE
IC703 (1/2)
IRIS DRIVE
IRIS OUT
M905 (1/2) FOCUS MOTOR
FOCUS N, FOCUS 8
IC701 (1/2)
FOCUS MOTOR DRIVE
IC613
AUTO FOCUS CPU
HALL AMP
HALL OUT
IC702
IC612
IC610
IC701 (1/2)
ZOOM MOTOR DRIVE
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc SYNC BLK, BR
SC, SCO 0
IC363
IC364
AUTO WHITE BALANCE
IC361
EVR/AW CPU
IC302
IC252
EVR D-A CONV
ADJUST VOLTAGE
DELTA R DELTA B
IC501
IC502
IC503
CAMERA REC Y.C PROCESS
REC CAM Y RF
REC CAM C RF
L INCS
IC611
ADJUST VOLTAGE
EVR D-A CONV
AUTO FOCUS PROCESS
YH
ZOOM W, ZOOM T
ZOOM W, ZOOM T
INNER BUS (DDS SO, DDS SI, DDS SCK)
(See Page 182)
FP-115 BOARD
S992 REC PROOF
ME/MP
H992 T REEL FG SENSOR
IC604 (1/3)
T-REEL FG AMP
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
TAPE TOP
LED DRIVE
H991 S REEL FG SENSOR
IC604 (1/3)
S-REEL FG AMP
Q992 TAPE END SENSOR
TAPE END
S991 C LOCK
MODE SW A-C
C LOCK
MODE SWITCH
DEW SENSOR
DEW
M903 LOARDING MOTOR
LM LD LM UNLD
INN
(See Page 187)
VF-40 BOARD
V901
CRT
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
DV1, DV2
T951
H OUT
H
HV
DH1, DH2
VS-67 BOARD
(See Page 152)
IC205
AUDIO VIDEO CONTROL SIGNALS
EXPANTION PORT
CHARACTER MIX
EVF W
(TI-30 BOARD IC802)
INNER BUS (COSMO SO, COSMO SI, COSMO SCK)
(See Page 183)
E, Australian MODEL VIDEO IN/OUT AUDIO IN/OUT
AEP, UK MODEL VIDEO OUT AUDIO OUT
J901
JK-63 BOARD
VIDEO IN/OUT
RFU DC OUT
AUDIO IN/OUT L, R
5V
AUDIO I/O L, R
VIDEO IN
VIDEO OUT
Y/CHROMA PROCESS
CAM C CAM Y
REC CAM Y RF
REC CAM C RF
OTL
IC206
IC102
IC101
REC/PB AMP
CH2 B CH2 A CH1 B CH1 A
FLYING ERASE
CH2B CH1B CH1A CH2A
DRUM
REC C
REC AFM
REC ATF
PB OUT
PB RF
RF SWP
1/2 RF SWP
IC201
IC202
IC203
PBC
COMP SYNC
IC204
PAL JOG
FLYING ERASE OSC
FE
REC 1A-REC 2B PB 1A MUTE-PB 2B MUTE
IC502
WAVE SHAPER
DPG, DFG
CFG
M901 DRUM MOTOR
DRUM PG, FG
M902 CAPSTAN MOTOR
CAPSTAN FG
IC501 (1/2)
DRUM MOTOR DRIVE
IC504
CAPSTAN MOTOR DRIVE
DC-DC CONVERTER (DD-30 (1/2) BOARD)
PWM POWER AMP
PWM POWER AMP
(See Page 16
(See Page 175)
MA-65 BOARD
MIC L
MIC R
MATRIX WINDO FILTER
L R
J401 MIC (PLUG IN POWER)
MIC AMP
AUDIO IN L, R
AUDIO OUT L, R
OUTPUT SELECT
IC802
L, R
HEADPHONE AMP
IC803
IC804
1.5/1.7 MIX
REC AFM RF
PB RF
IC607
SP/LP DET CLOG DET
CLOG PB SP/LP
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
MIC L, R
AFM STEREO AUDIO PROCESS
L, R
REC AFM RF 1.5, 1.7
IC701
IC704
PLL ERROR 1.5, 1.7
PLL
IC801
PB RF 1.5, 1.7
AU-85 BOARD
(See Page 163)
AU-86 BOARD
(See Page 165)
PD-18 BOARD
CNR
HEADPHONE L, R

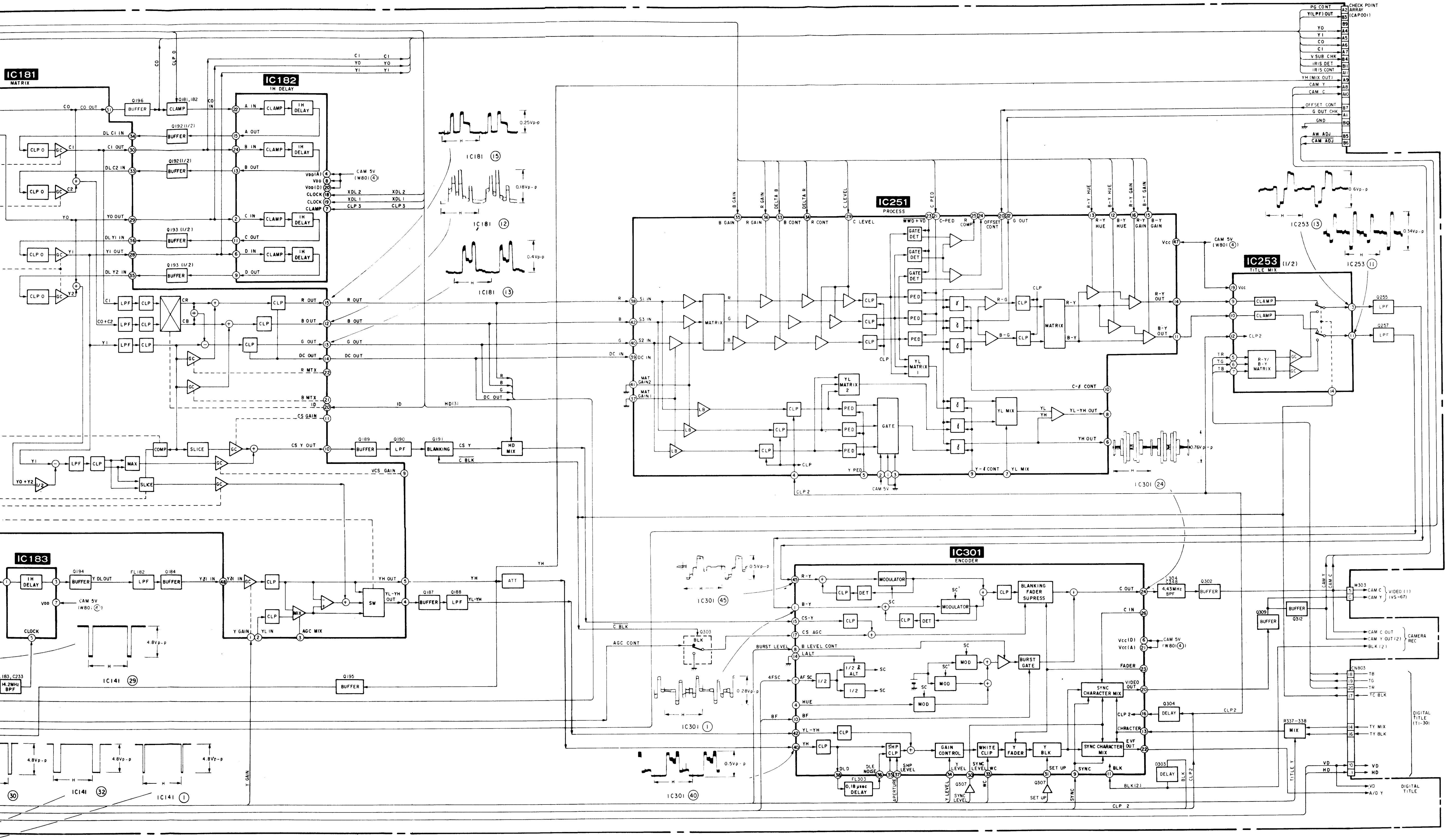

(See Page 139)
EVF W
IC801
IC803
IC802
TR,TG,TB
TY
A/D Y
DIGITAL TITLE
CHARACTOR GENERATOR
TI-30 BOARD
(See Page 181)
CF-1 SWITCH BLOCK
S751-765
CAMERA FUNCTION, COUNTER SWITCH
S766
EDIT SWITCH
EDIT SW
IC561
FEATURE CONTROL (DDS CPU)
ND751
LCD
LC-11 BOARD
(See Page 183)
INNER BUS (DDS SO, DDS SI, DDS SCK)
A/D CONV
IC253 (1/2)
IC301
ENCODER Y TITLE MIX
IC253 (1/2)
CHROMA TITLE MIX
R-Y
B-Y
-YH
CAM Y, CAM C
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
IC501
IC502
IC503
CAMERA REC Y.C PROCESS
IC302
IC252
EVR D-A CONV
IC361
EVR/AW CPU
DELTA R
DELTA B
ADJUST VOLTAGE
REC CAM Y RF
REC CAM C RF
LINCS
INNER BUS (COSMO SO, COSMO SI, COSMO SCK)
(See Page 182)
FP-115 BOARD
H992
T REEL FG SENSOR
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
H991
S REEL FG SENSOR
Q992 TAPE END SENSOR
S991 C LOCK
IC604 (1/3)
T-REEL FG AMP
ME/MP
TAPE TOP
LED DRIVE
IC604 (1/3)
S-REEL FG AMP
TAPE END
MODE SW A-C
C LOCK
TAPE TOP DETECT
T/E LED ON
TAPE END DETECT
DEW
C LOCK
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
WAKE-UP
LINCS
CAMERA POWER SW, VTR POWER SW, REC S/S SW, EJECT SW
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
LED DRIVE
WAKE UP DETECT
FK-1 SWITCH BLOCK
(See Page 182)
S911, 912
ZOOM W, ZOOM T
ZOOM SWITCH
D901-903
DISPLAY LED
S902-907
VTR FUNCTION SWITCH
S901, 908-910
CAMERA/VTR POWER SW
STANDBY SW
REC START/STOP SW
EJECT SW
J902
REMOTE
HEADPHONE L,R
J903
HEADPHONES
(See Page 177)
EL-10 BOARD
MODE SWITCH
DEW SENSOR
DEW (+)
DEW DETECT
DEW
LM LD
LM UNLD
M903 LOADING MOTOR
LOADING MOTOR DRIVE
LM LD, LM UNLD
IC605
IC102
IC101
RF
REC/PB AMP
CH2 B
CH2 A
CH1 B
CH1 A
FLYING ERASE
DRUM
RF SWP
1/2 RF SWP
FLYING ERASE OSC
FE
IC502
WAVE SHAPER
DPG, DFG
CFG
REC 1A-REC 2B
PB 1A MUTE-PB 2B MUTE
CLOG
PB SP/LP
M901 DRUM MOTOR
DRUM PG,FG
M902 CAPSTAN MOTOR
CAPSTAN FG
IC501 (1/2)
DRUM MOTOR DRIVE
IC504
CAPSTAN MOTOR DRIVE
DC-DC CONVERTER (DD-30 BOARD) (1/2)
PWM POWER AMP
PWM POWER AMP
(See Page 162)
IC501 (1/2)
D-A CONVERTER
DRUM D/A
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
(See Page 162)
DC-DC CONVERTER (1/2) (DD-30 BOARD)
AF UNREG
CAMERA POWER
23V
15V
-9V
CAM 5V
CAM ON
CAMERA DC-DC CONVERTER
VTR POWER
REG 5V
VIDEO 5V
EVF 5V
VTR UNREG
VTR DC-DC CONVERTER
CAM UNREG
VTR ON
BATTERY

3-3. CAMERA BLOCK DIAGRAM

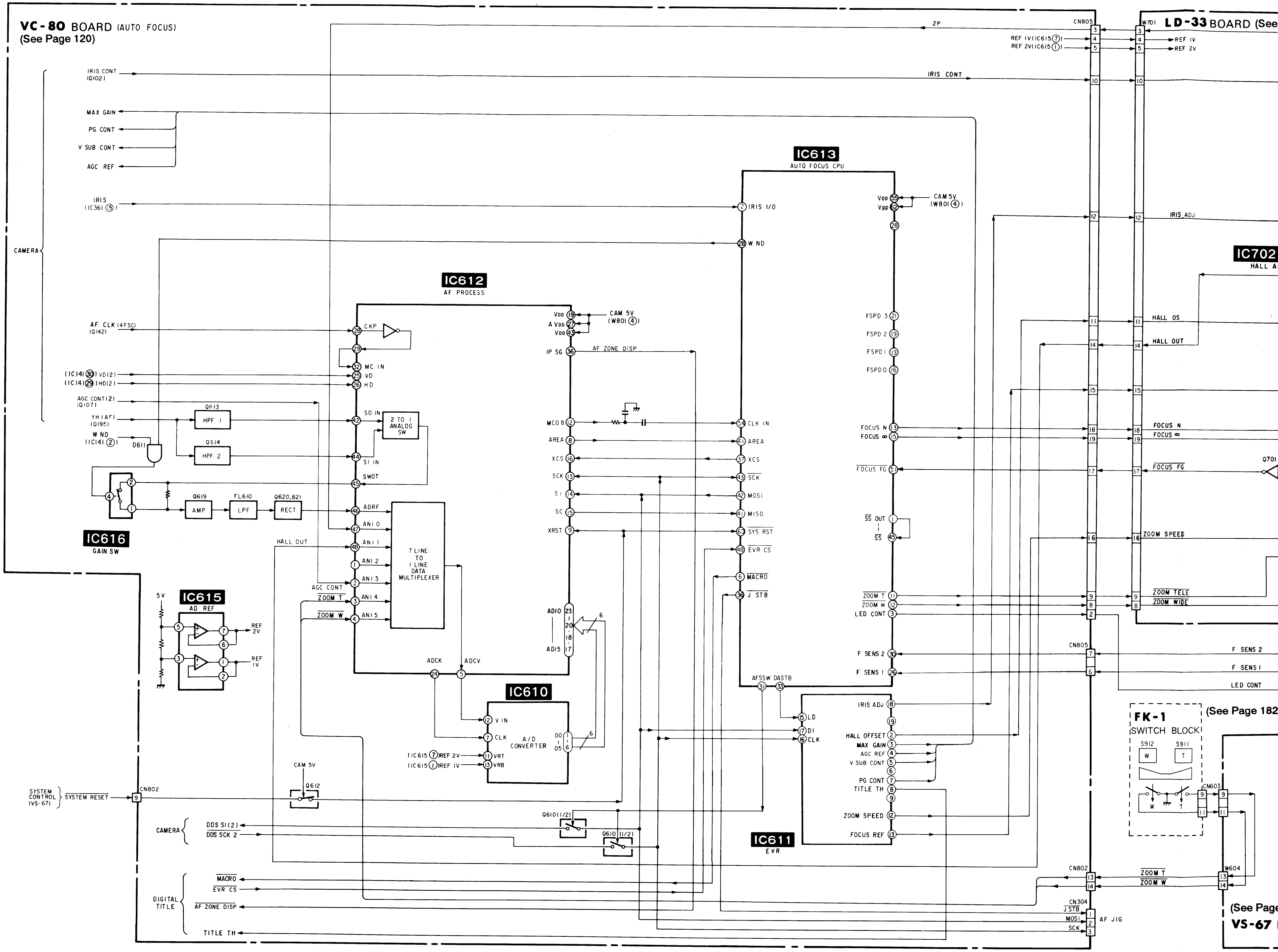

CD-43 BOARD (See Page 129)
IC901 CCD IMAGER
Q901 BUFFER
CCD OUT
V1
V2
V3
V4
SUB
W901
IC901 ①, ②
IC901 ③, ⑥
Q901 Ⓢ
IC901 ⑰
IC901 ⑱
IC901 ⑲
9.5MHz
4Vp-p
9Vp-p
0.42Vp-p
8.6Vp-p
4.7Vp-p
PG CONT
V SUB CHK
V SUB
(See Page 177)
EL-10 BOARD
J902
REMOTE
DC OUT
CN942
CF-1 BOARD SWITCH BLOCK
CN752
CN751
CN804
CN802
(See Page 181)
SERIAL CONT (SYSCON) (VS-67)
VC-80 BOARD (See Page 112)
3.9MHz
5.6Vp-p
IC361 EVR/AUTO WHITE BALANCE CPU
IC362 RESET
IC364 (1/4) AW COMPARATOR
IC363 (1/2) SWITCH
INTEGRATOR
BLANKING
Q363
Q364 (1/2)
Q365 BLANKING PULSE SEP
IC364 (1/4) TRIANGLE WAVEFORMER
IC364 (1/4) DC OUT BUFFER
IC363 (1/2) DISCHARGE
Q367 CURRENT SORCE
IC364 (1/4) CURRENT SOURCE
X361 OSC
EVER 5V
DIGITAL TITLE
EVR CS
DDS SC
DDS SI
DDS SCK
A/D EN
AW IN
CAM 5V (W801 ④)
AW ADJ
CAM ADJ
BACK LIGHT
TG STB
IRIS I/O
SYSCON (VS-67) CAM ADJ
IC302 EVR
IC252 EVR
C1 GAIN
Y1 GAIN
FADER LEVEL
BURST LEVEL
HUE CONT
SYNC LEVEL
SET UP
WHITE CLIP
Y LEVEL
APERTURE
Y GAIN
C2 GAIN
DELTA R
DELTA B
FADER
C-PED
R-Y GAIN
B-Y GAIN
R-Y HUE
B-Y HUE
C LEVEL
TITLE Y
R GAIN
B GAIN
DT-77J BOARD (See Page 112)
IC051 SIGNAL SEPARATION AGC/IRIS CONTROL
MAX GAIN
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
GATE
COMP
MAX
SLICE
OR
MODE SWITCH
WINDOW
Y OUT
S1 OUT
S2 OUT
F3 OUT
DC OUT (1.9Vdc)
CS OUT
AGC SEL
AGC CONT R
Q131, 132 V SUB REG
23V (W801 ①)
VG (3Vdc)
WND
FL181, 184 Y LPF
Q183 BUFFER
DT-77 BOARD ⑲ ⑳ ㉗
DT-77 BOARD ㉕
DT-77 BOARD ⑩ ⑪ ⑫
Q101 AGC DET
Q106 AGC SWITCH
Q112 WINDOW
Q111 WINDOW
Q102 IRIS DET
Q107 ATT BUFFER
IC003 V DRIVE
IC002 TIMING GENERATOR
IC001 ROM
AUTO FOCUS
DT-77 BOARD ㊽
DT-77 BOARD ⑨
DT-77 BOARD ③
DT-77 BOARD ⑦
DT-77 BOARD ②
DT-77 BOARD ⑥
14.188MHz
28.375MHz
X101 28.375MHz OSC
Q003
Q142 4FSC BUFFER
IC141 (1/2) TIMING GENERATOR
SYNC GENERATOR
PHASE COMP
DIVIDER
BUFFER Q141
D142
CT142
X141
MODE (PAL/NT)
Q113

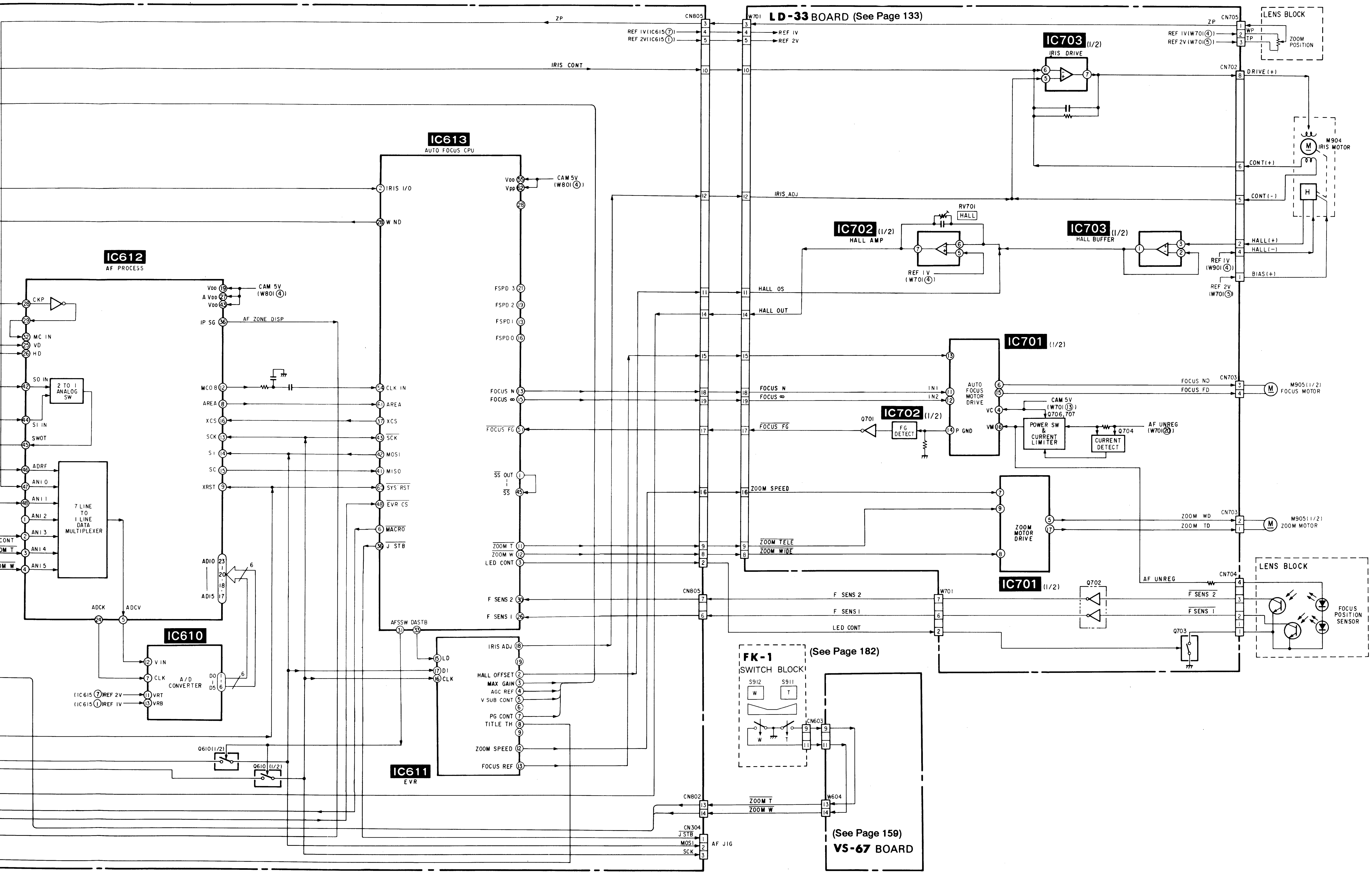
http://www.manualscenter.com


(Page 112)
IC181
MATRIX
IC182
1H DELAY
IC183
IC002
TIMING GENERATOR
IC001
ROM
IC141 (1/2)
TIMING GENERATOR
AGC SEL
AGC CONT R
XSHP
AGC SEL
AGC MAX
AGC CONT
AGC CLP
FSH1
F1CLP
F2CLP
F3LCP
XSH1
XSH2
SAMPL HOLD
LPF
CLAMP BLANKING
GATE
AGC
CLAMP
CLP1
XSP1
XSP2
XSP3
P BLK
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
CLAMP
PBLK
WHO
GY OUT
F1 OUT
F2 OUT
F3 OUT
DC OUT (1.9Vdc)
CS AGC SL
CS AGC GC
CS OUT
CS CCD GC
CS CCD SL
CS CLP
AGC OUT
DET LEVEL
DET OUT
DET CLP
IRIS OUT
IRIS CLP
IRIS LEVEL
IRIS GC
OP IN+
OP IN-
OP OUT
VG OUT
VG (3Vdc)
WND
Y OUT
S1 OUT
S2 OUT
FL181,184
Y LPF
Q183
BUFFER
Q101
AGC DET
Q106
AGC SWITCH
Q112
WINDOW
Q111
WINDOW
Q102
IRIS DET
Q107
ATT BUFFER
AGC REF
VG(DC 3V)
Y(LPF) OUT
IRIS DET
IRIS CONT
BACK LIGHT
AGC CONT(2)
Q113
CAM ADJ
0.36Vp-p
DT-77 BOARD (18)
DT-77 BOARD (19) (20) (27)
(19) (20) 0.36Vp-p
(27) 0.24Vp-p
0.4Vp-p
DT-77 BOARD (25)
4.8Vp-p
DT-77 BOARD (23)
DT-77 BOARD (10) (11) (12)
4.8Vp-p
DT-77 BOARD (9)
1Vp-p
14.188MHz
DT-77 BOARD (3)
DT-77 BOARD (7)
1.8Vp-p
28.375MHz
DT-77 BOARD (2)
DT-77 BOARD (6)
XSUB
XV2
XV1
XSG1
XV3
XSG2
XV4
XVSUB
XSHP
XSHO
XSP1
XSP2
XSH1
XSH2
XDL1/XSP3
XDL2/XSH3
BFG
CLP1
CLP2
CLP3
CLP4
PBLX
ID
WEN
PBLK
Q003
XDL1
XDL2
CLP0
1/2
CL
CX
CK/OSCO
OSI
HD
VD
ED0/STB
ED1/CLK
ED2/DATA
X101
28.375MHz OSC
STB
CLK
DATA
TG STB
DDS SCK(2)
DDS SI(2)
VEE
H2
H1
NC
PG
A0
A5
D1
D4
XVCT
Q142
4FSC BUFFER
AF CLK
HD(2)
VD(2)
YH(AF)
WND
4FSC
CAM 5V (W801 (4))
VDD1
VDD2
CL IN
CL OUT
SYNC GENERATOR
SYNC
BLK
BF
FLO
LALT
WE
AF WN
PHASE COMP
DIVIDER
LPF
BUFFER
Q141
D142
CT142
X141
HD(3)
S1 IN
S2 IN
CLP 0
C1 GAIN
C2 GAIN
Y1 GAIN
CLP2
AP CUT
Q185,186
AP LEVEL CONT
SLICE
AP GAIN
OFFSET
Y IN
CLP
γ
Vcc
Yγ CONT
CO OUT
DL C1 IN
C1 OUT
DL C2 IN
YO OUT
DL Y1 IN
Y1 OUT
DL Y2 IN
Q196
BUFFER
Q181,182
CLAMP
Q192 (1/2)
Q193 (1/2)
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
VDD(A)
VDD
VDD(D)
CLOCK
CLAMP
XDL2
XDL1
CLP3
C1
YO
Y1
CO
CO IN
CLP O
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
CS GAIN
CS Y OUT
VCS GAIN
Q189
BUFFER
Q190
LPF
Q191
BLANKING
CS Y
C BLK
HD MIX
HD(3)
COMP
SLICE
MAX
Y0+Y2
Y1
1/2
IH DELAY
Q194
BUFFER
Y DLOUT
FL182
LPF
Q184
BUFFER
YγI IN
YH OUT
YL-YH OUT
SW
MIX
Y GAIN
YL IN
AGC MIX
Q187
BUFFER
Q188
LPF
YL-YH
YH
ATT
CLOCK
L183, C233
14.2MHz BPF
Q195
BUFFER
4.8Vp-p
IC141 (29)
IC141 (31)
IC141 (30)
IC141 (32)
IC141 (1)
0.25Vp-p
IC181 (15)
0.18Vp-p
IC181 (12)
0.4Vp-p
IC181 (13)
S1 IN
S3 IN
S2 IN
DC IN
MAT GAIN2
MAT GAIN1
MATRIX
LB
B GAIN
C BLK
AGC CONT
Q303
BLK
IC301 (45)
IC301 (1)
0.5Vp-p
IC301 (40)


IC181 MATRIX
IC182 1H DELAY
IC183
IC251 PROCESS
IC253 (1/2) TITLE MIX
IC301 ENCODER
CHECK POINT ARRAY (CAP001)
PG CONT
Y(LPF) OUT
YO
YI
CO
CI
V.SUB CHK
IRIS DET
IRIS CONT
YH(MIX OUT)
CAM Y
CAM C
OFFSET CONT
G OUT CHK
GND
AW ADJ
CAM ADJ
CLAMP
1H DELAY
BUFFER
CLP O
GC
LPF
CLP
COMP
SLICE
MAX
1/2
SW
ATT
HD MIX
BLANKING
MATRIX
GATE DET
PED
YL MATRIX
YL MIX
GATE
R-Y/B-Y MATRIX
MODULATOR
DET
BLANKING FADER SUPRESS
BURST GATE
MOD
1/2 & ALT
SYNC CHARACTER MIX
DELAY
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
0.18μsec DELAY
4.43MHz BPF
14.2MHz BPF
MIX
CAM 5V (W801④)
IC181 ⑮ 0.25Vp-p
IC181 ⑫ 0.18Vp-p
IC181 ⑬ 0.4Vp-p
IC253 ⑬ 0.6Vp-p
IC253 ⑪ 0.34Vp-p
IC301 ㉔ 0.76Vp-p
IC301 ㊺ 0.5Vp-p
IC301 ① 0.28Vp-p
IC301 ㊵ 0.5Vp-p
IC141 ㉙ 4.8Vp-p
IC141 ㉜ 4.8Vp-p
IC141 ① 4.8Vp-p
CAMERA REC
DIGITAL TITLE (T1-30)
DIGITAL TITLE
VIDEO (1) (VS-67)
CN803
W303
Q303
Q304
Q307
Q309
Q312
Q302
Q255
Q257
R337-338

3-4. AUTO FOCUS BLOCK DIAGRAM


VC-80 BOARD (AUTO FOCUS)
(See Page 120)
LD-33 BOARD (See
IC613
AUTO FOCUS CPU
IC612
AF PROCESS
IC616
GAIN SW
IC615
AD REF
IC610
A/D CONVERTER
IC611
EVR
IC702
HALL A
7 LINE TO 1 LINE DATA MULTIPLEXER
2 TO 1 ANALOG SW
HPF 1
HPF 2
AMP
LPF
RECT
Q613
Q614
Q619
FL610
Q620,621
Q612
Q610(1/2)
Q701
D611
CAMERA
IRIS CONT (Q102)
MAX GAIN
PG CONT
V SUB CONT
AGC REF
IRIS (IC361 ⑤)
AF CLK (4FSC) (Q142)
(IC141 ㉚) VD(2)
(IC141 ㉙) HD(2)
AGC CONT(2) (Q107)
YH (AF) (Q195)
W ND (IC141 ②)
ZP
REF 1V (IC615 ⑦)
REF 2V (IC615 ①)
IRIS CONT
IRIS ADJ
HALL OS
HALL OUT
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM SPEED
ZOOM TELE
ZOOM WIDE
F SENS 2
F SENS 1
LED CONT
CAM 5V (W801 ④)
AF ZONE DISP
CN805
CN802
CN304
CN603
W701
W604
FK-1 SWITCH BLOCK
(See Page 182
S912
S911
W
T
SYSTEM CONTROL (VS-67)
SYSTEM RESET
CAMERA
DDS SI (2)
DDS SCK 2
DIGITAL TITLE
MACRO
EVR CS
AF ZONE DISP
TITLE TH
AF JIG
J STB
MOSI
SCK
ZOOM T
ZOOM W
(See Page
VS-67
REF 2V
REF 1V
5V
HALL OUT
AGC CONT
ADCK
ADCV
AFSSW DASTB
IRIS I/O
W ND
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
MACRO
J STB
FSPD 3
FSPD 2
FSPD 1
FSPD 0
SS OUT
SS
LED CONT
IRIS ADJ
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
PG CONT
TITLE TH
ZOOM SPEED
FOCUS REF
LD
DI
CLK
V IN
VRT
VRB
D0 – D5
(IC615 ⑦) REF 2V
(IC615 ①) REF 1V
CKP
MC IN
VD
HD
S0 IN
S1 IN
SWOT
ADRF
AN1 0
AN1 1
AN1 2
AN1 3
AN1 4
AN1 5
VDD
A VDD
IP SG
MCO 8
AREA
XCS
SCK
SI
SC
XRST
ADIO
ADI5
Vpp


LD-33 BOARD (See Page 133)
IC703 (1/2) IRIS DRIVE
IC702 (1/2) HALL AMP
IC703 (1/2) HALL BUFFER
RV701 HALL
IC701 (1/2) AUTO FOCUS MOTOR DRIVE
IC702 (1/2) FG DETECT
IC701 (1/2) ZOOM MOTOR DRIVE
IC613 AUTO FOCUS CPU
IC612 AF PROCESS
IC610 A/D CONVERTER
IC611 EVR
2 TO 1 ANALOG SW
7 LINE TO 1 LINE DATA MULTIPLEXER
LENS BLOCK
ZOOM POSITION
M904 IRIS MOTOR
M905 (1/2) FOCUS MOTOR
M905 (1/2) ZOOM MOTOR
FOCUS POSITION SENSOR
POWER SW & CURRENT LIMITER
CURRENT DETECT
Q701
Q702
Q703
Q704
Q706, 707
Q610 (1/2)
CN805
CN802
CN304
CN705
CN702
CN703
CN704
CN603
W701
W604
ZP
REF 1V (IC615 ⑦)
REF 2V (IC615 ①)
IRIS CONT
IRIS ADJ
HALL OS
HALL OUT
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM SPEED
ZOOM TELE
ZOOM WIDE
ZOOM T
ZOOM W
LED CONT
F SENS 2
F SENS 1
AF UNREG
DRIVE (+)
CONT (+)
CONT (-)
HALL (+)
HALL (-)
BIAS (+)
FOCUS ND
FOCUS FD
ZOOM WD
ZOOM TD
CAM 5V (W801 ④)
AF ZONE DISP
AF JIG
J STB
MOSI
SCK
FK-1 SWITCH BLOCK (See Page 182)
S912 W
S911 T
(See Page 159) VS-67 BOARD

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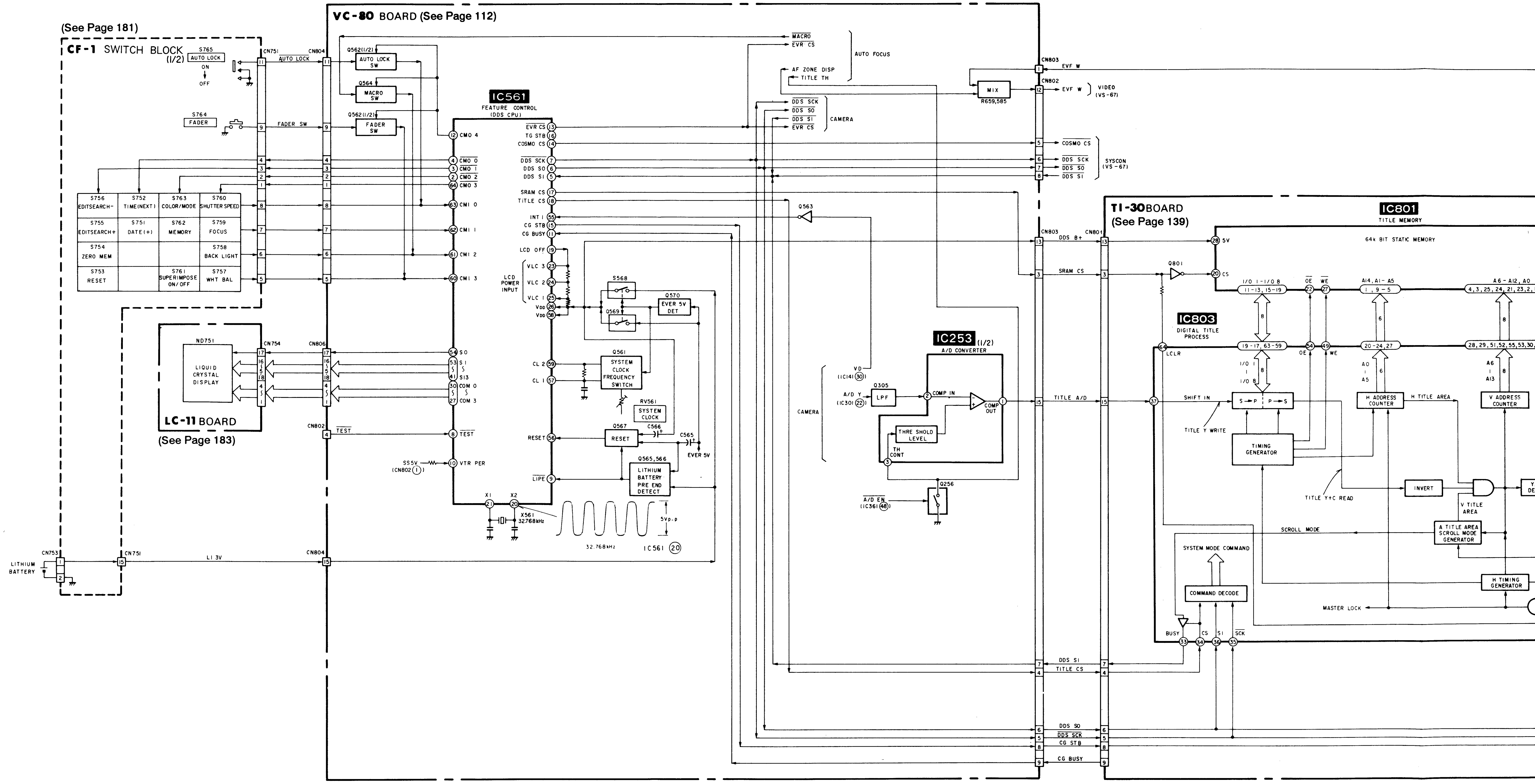
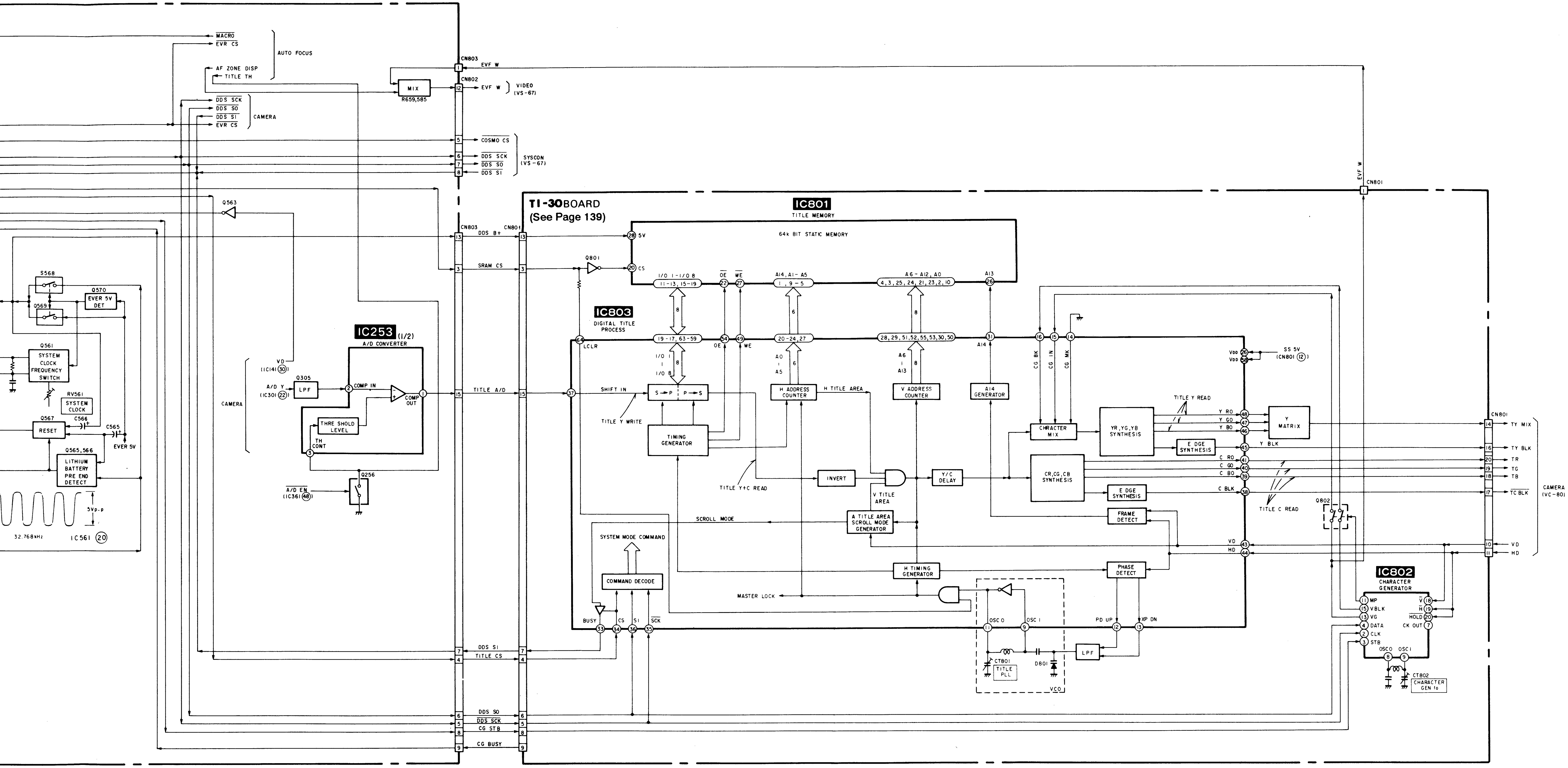
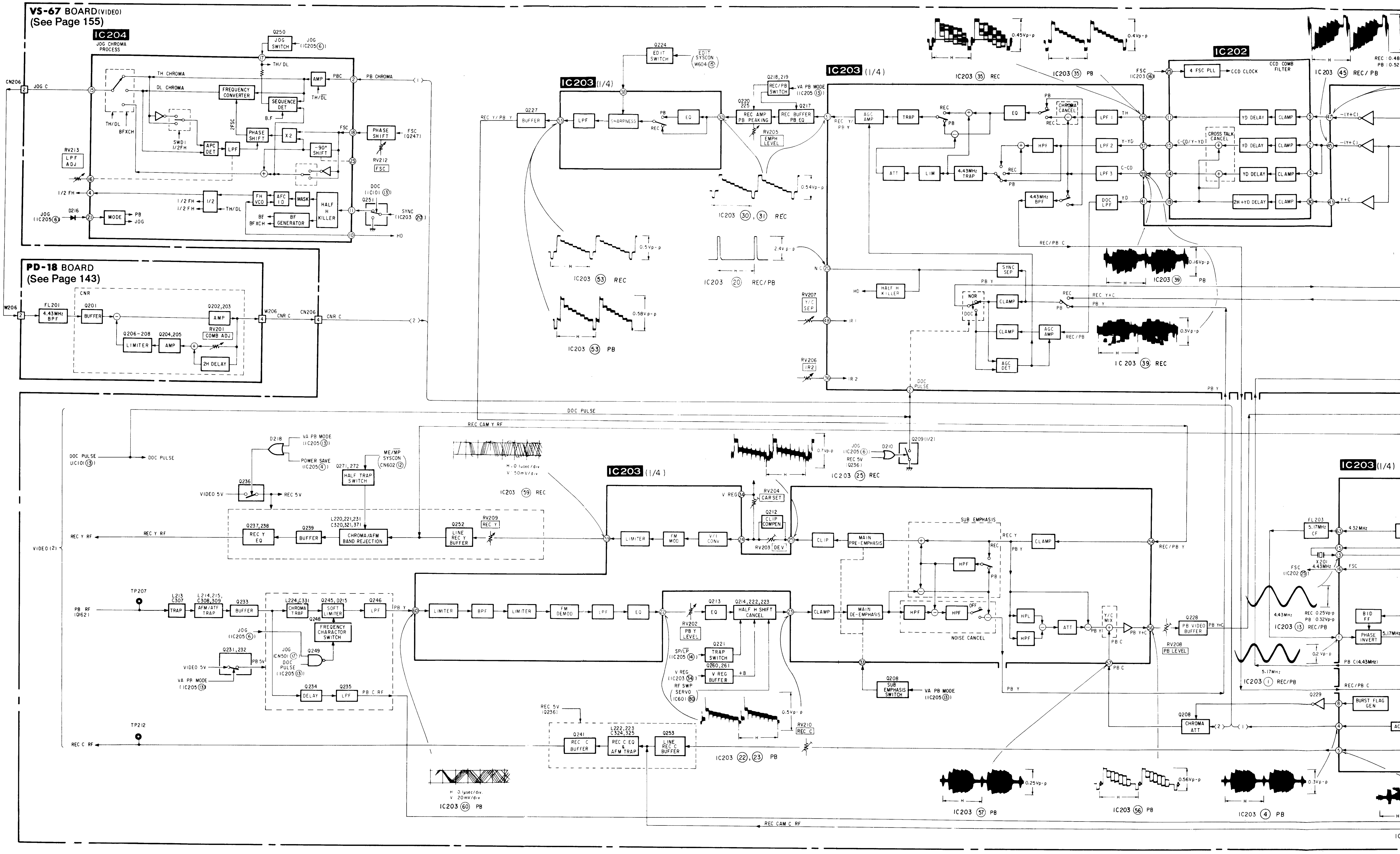
3-5. DIGITAL TITLER BLOCK DIAGRAM



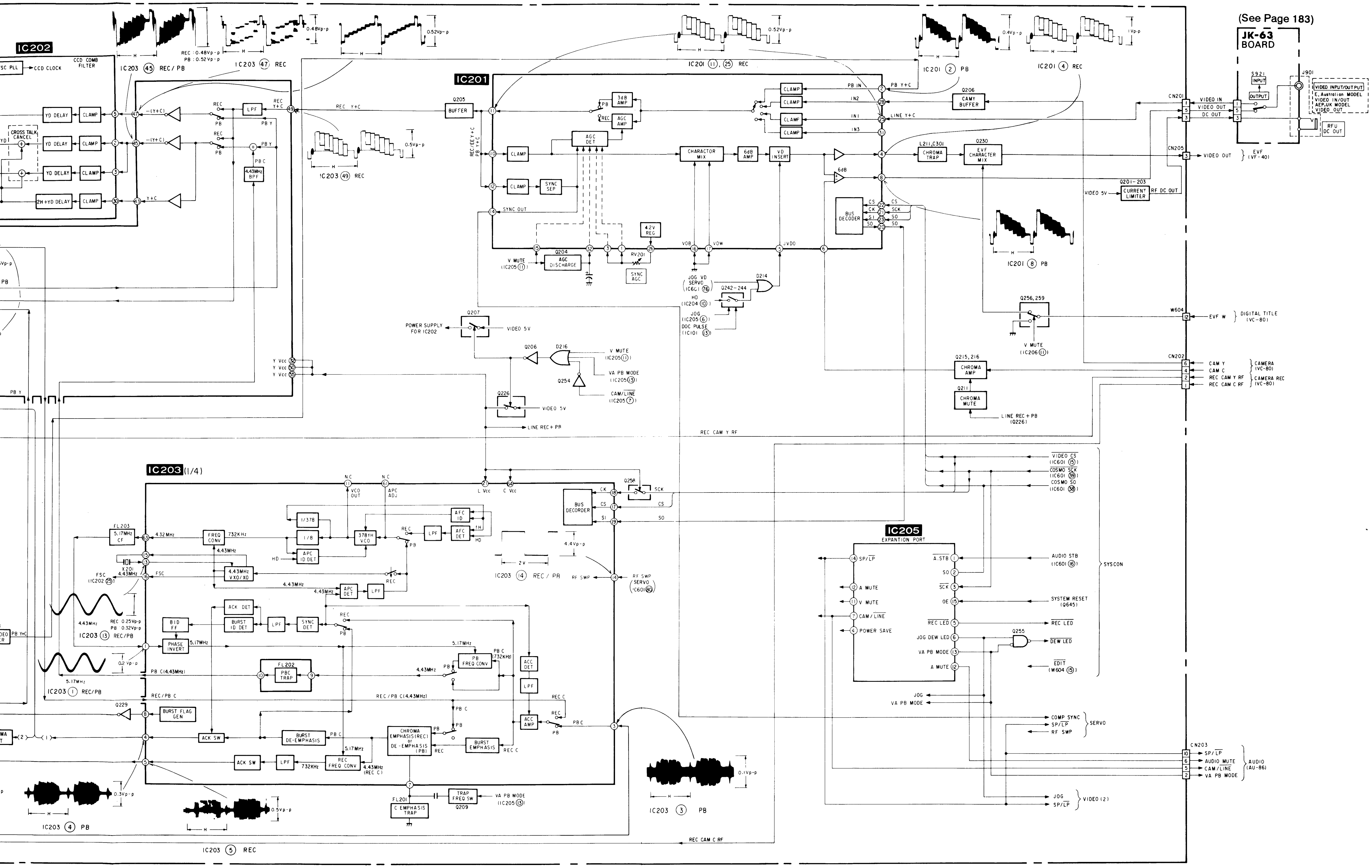
(See Page 181)
CF-1 SWITCH BLOCK (1/2)
S765 AUTO LOCK ON OFF
S764 FADER
S756 EDITSEARCH−
S752 TIME(NEXT)
S763 COLOR/MODE
S760 SHUTTER SPEED
S755 EDITSEARCH+
S751 DATE(+)
S762 MEMORY
S759 FOCUS
S754 ZERO MEM
S758 BACK LIGHT
S753 RESET
S761 SUPERIMPOSE ON/OFF
S757 WHT BAL
CN751
CN804
AUTO LOCK
FADER SW
ND751 LIQUID CRYSTAL DISPLAY
LC-11 BOARD
(See Page 183)
CN754
CN806
CN802
TEST
CN753
LITHIUM BATTERY
LI 3V
VC-80 BOARD (See Page 112)
Q562(1/2) AUTO LOCK SW
Q564 MACRO SW
Q562(1/2) FADER SW
IC561 FEATURE CONTROL (DDS CPU)
CMO 4
CMO 0
CMO 1
CMO 2
CMO 3
CMI 0
CMI 1
CMI 2
CMI 3
S0
S1
S13
COM 0
COM 3
TEST
SS5V
(CN802 ①)
VTR PER
EVR CS
TG STB
COSMO CS
DDS SCK
DDS SO
DDS SI
SRAM CS
TITLE CS
INT I
CG STB
CG BUSY
LCD OFF
LCD POWER INPUT
VLC 3
VLC 2
VLC 1
VDD
CL 2
CL 1
RESET
LIPE
X1
X2
X561 32.768kHz
32.768kHz
IC561 ⑳
5Vp-p
S568
S569
Q570 EVER 5V DET
Q561 SYSTEM CLOCK FREQUENCY SWITCH
RV561 SYSTEM CLOCK
Q567 RESET
C566
C565
EVER 5V
Q565,566 LITHIUM BATTERY PRE END DETECT
MACRO
EVR CS
AUTO FOCUS
AF ZONE DISP
TITLE TH
DDS SCK
DDS SO
DDS SI
EVR CS
CAMERA
Q563
MIX R659,585
CN803
EVF W
CN802
EVF W
VIDEO (VS-67)
COSMO CS
DDS SCK
DDS SO
DDS SI
SYSCON (VS-67)
DDS B+
SRAM CS
TITLE A/D
IC253 (1/2) A/D CONVERTER
VD (IC141 ㉚)
A/D Y (IC301 ㉒)
Q305 LPF
COMP IN
COMP OUT
THRE SHOLD LEVEL
TH CONT
CAMERA
Q256
A/D EN (IC361 ㊽)
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY
TI-30 BOARD
(See Page 139)
CN801
IC801 TITLE MEMORY
64k BIT STATIC MEMORY
5V
CS
Q801
I/O 1 - I/O 8
11-13, 15-19
OE
WE
A14, A1 - A5
1, 9-5
A6 - A12, A0
4,3,25,24,21,23,2,
IC803 DIGITAL TITLE PROCESS
LCLR
19-17, 63-59
20-24,27
28,29,51,52,55,53,30,
I/O 1 I I/O 8
A0 I A5
A6 I A13
SHIFT IN
S→P P→S
TITLE Y WRITE
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
TIMING GENERATOR
TITLE Y+C READ
INVERT
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
SYSTEM MODE COMMAND
COMMAND DECODE
H TIMING GENERATOR
MASTER LOCK
BUSY
CS
SI
SCK


MACRO
EVR CS
AUTO FOCUS
AF ZONE DISP
TITLE TH
DDS SCK
DDS SO
DDS SI
EVR CS
CAMERA
CN803
EVF W
CN802
MIX
R659,585
EVF W
VIDEO
(VS-67)
COSMO CS
DDS SCK
DDS SO
DDS SI
SYSCON
(VS-67)
Q563
S568
Q570
EVER 5V
DET
Q569
Q561
SYSTEM
CLOCK
FREQUENCY
SWITCH
RV561
SYSTEM
CLOCK
Q567
C566
RESET
C565
EVER 5V
Q565,566
LITHIUM
BATTERY
PRE END
DETECT
5Vp-p
32.768kHz
IC561 (20)
CAMERA
VD
(IC141 (30))
A/D Y
(IC301 (22))
Q305
LPF
IC253 (1/2)
A/D CONVERTER
COMP IN
COMP
OUT
THRE SHOLD
LEVEL
TH
CONT
A/D EN
(IC361 (48))
Q256
CN803
CN801
DDS B+
SRAM CS
TITLE A/D
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY
TI-30BOARD
(See Page 139)
IC801
TITLE MEMORY
64k BIT STATIC MEMORY
5V
Q801
CS
I/O 1-I/O 8
11-13, 15-19
OE
WE
A14, A1-A5
1, 9-5
A6-A12, A0
4,3,25,24,21,23,2,10
A13
IC803
DIGITAL TITLE
PROCESS
LCLR
19-17, 63-59
OE
WE
20-24, 27
28,29,51,52,55,53,30,50
A14
I/O 1
I/O 8
A0
A5
A6
A13
8
6
SHIFT IN
S→P
P→S
TITLE Y WRITE
TIMING
GENERATOR
H ADDRESS
COUNTER
H TITLE AREA
V ADDRESS
COUNTER
A14
GENERATOR
CG BK
CG IN
CG MK
VDD
SS 5V
(CN801 (12))
TITLE Y READ
CHRACTER
MIX
YR,YG,YB
SYNTHESIS
Y RO
Y GO
Y BO
Y
MATRIX
E DGE
SYNTHESIS
Y BLK
C RO
C GO
C BO
C BLK
CR,CG,CB
SYNTHESIS
E DGE
SYNTHESIS
TITLE C READ
INVERT
Y/C
DELAY
TITLE Y+C READ
V TITLE
AREA
A TITLE AREA
SCROLL MODE
GENERATOR
SCROLL MODE
FRAME
DETECT
VD
HD
SYSTEM MODE COMMAND
COMMAND DECODE
H TIMING
GENERATOR
PHASE
DETECT
MASTER LOCK
BUSY
CS
SI
SCK
OSC O
OSC I
PD UP
XP DN
CT801
TITLE
PLL
D801
LPF
VCO
EVF W
CN801
TY MIX
TY BLK
TR
TG
TB
TC BLK
VD
HD
CAMERA
(VC-80)
Q802
IC802
CHARACTER
GENERATOR
MP
VBLK
VG
DATA
CLK
STB
V
H
HOLD
CK OUT
OSCO
OSCI
CT802
CHARACTER
GEN fo

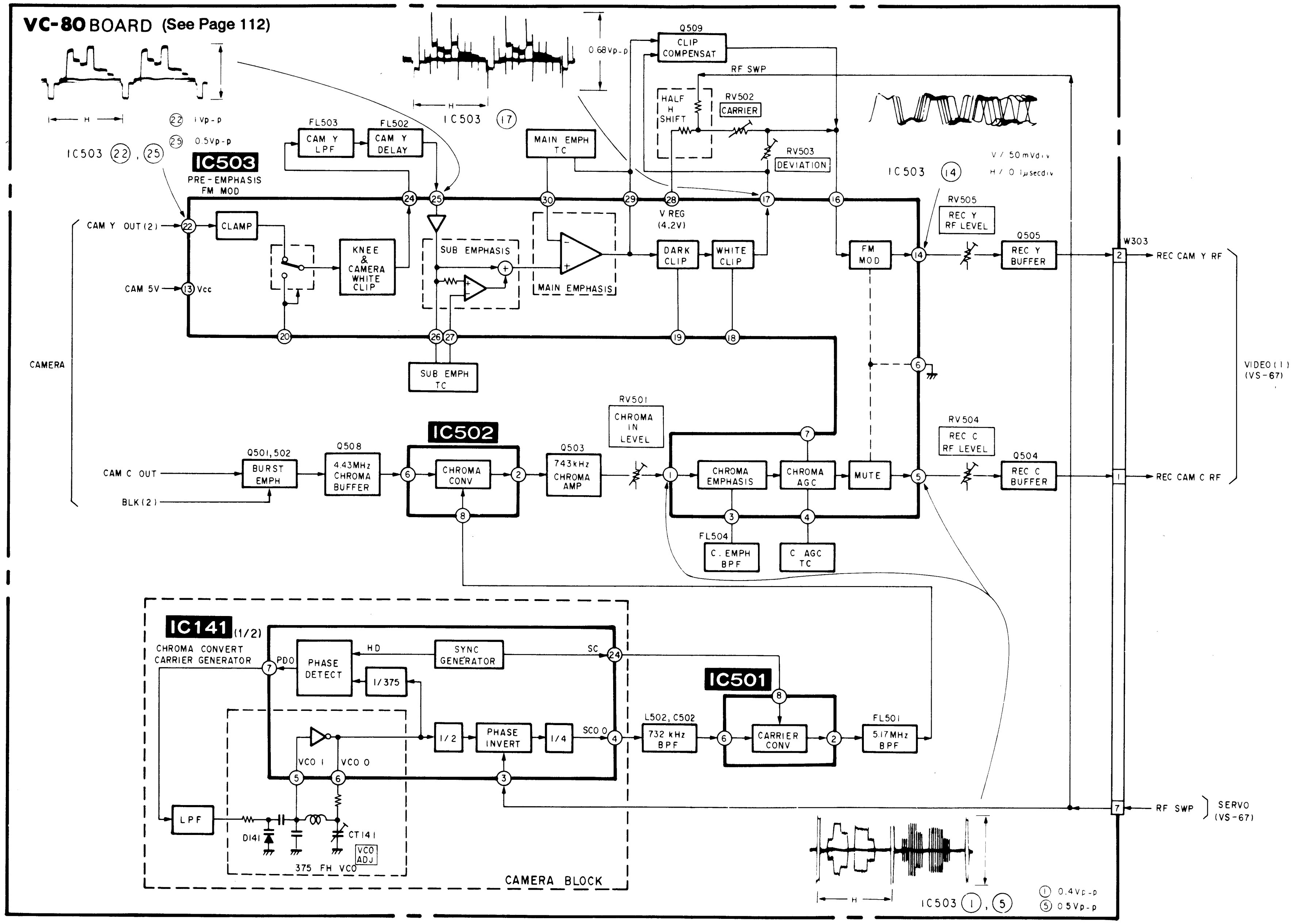
3-6. VIDEO (1) BLOCK DIAGRAM



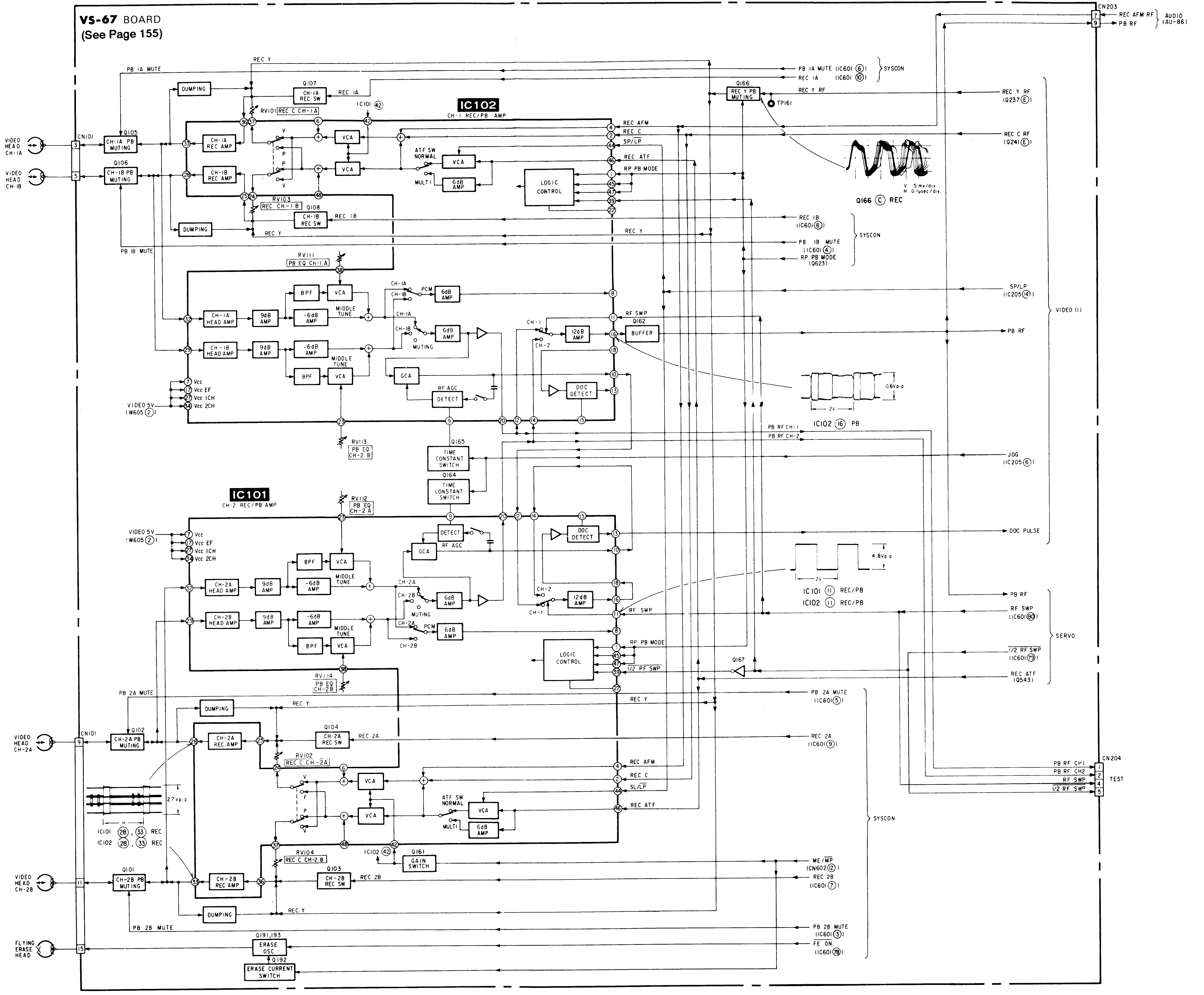
VS-67 BOARD (VIDEO)
(See Page 155)
IC204
JOG CHROMA PROCESS
CN206
JOG C
TH CHROMA
DL CHROMA
FREQUENCY CONVERTER
SEQUENCE DET
AMP
PBC
PB CHROMA
Q250
JOG SWITCH
JOG (IC205 ⑥)
TH/DL
PHASE SHIFT
X2
-90° SHIFT
APC DET
LPF
SWD1 1/2FH
TH/DL
BFXCH
2FSC
B.F
FSC
PHASE SHIFT (Q247)
FSC
RV212 FSC
RV213 LPF ADJ
1/2 FH
1/2
FH VCO
AFC I.D
MASK
HALF H KILLER
BF GENERATOR
BFXCH
DOC (IC101 ⑬)
Q251
SYNC (IC203 ⑳)
HD
JOG (IC205 ⑥)
D216
MODE
PB
JOG
PD-18 BOARD
(See Page 143)
W206
FL201 4.43MHz BPF
CNR
Q201 BUFFER
Q202,203 AMP
RV201 COMB ADJ
Q206-208 LIMITER
Q204,205 AMP
2H DELAY
W206 CNR C
CN206
CNR C
Q224 EDIT SWITCH
EDIT SYSCON (W604 ⑤)
IC203 (1/4)
Q227 BUFFER
REC Y/PB Y
LPF
SHARPNESS
EQ
Q218,219 REC/PB SWITCH
VA PB MODE (IC205 ⑬)
Q220,225 REC AMP PB PEAKING
Q217 REC BUFFER PB EQ
RV205 EMPH LEVEL
IC203 ㉚, ㉛ REC
0.54Vp-p
IC203 �53 REC
0.5Vp-p
IC203 ⑳ REC/PB
2.4Vp-p
IC203 �53 PB
0.58Vp-p
IC203 (1/4)
AGC AMP
TRAP
EQ
CHROMA CANCEL
HPF
ATT
LIM
4.43MHz TRAP
4.43MHz BPF
LPF 1
LPF 2
LPF 3
DOC LPF
SYNC SEP
HALF H KILLER
NOR
DOC
CLAMP
AGC AMP
AGC DET
RV207 Y/C SEP
RV206 IR2
IR 1
IR 2
DOC PULSE
REC/PB C
0.45Vp-p
0.4Vp-p
IC203 ㉟ REC
IC203 ㉟ PB
0.16Vp-p
IC203 ㊴ PB
0.3Vp-p
IC 203 ㊴ REC
IC202
FSC (IC203 ⑥)
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
YD DELAY
CLAMP
CROSS TALK CANCEL
2H+YD DELAY
C-CD/Y-YD
Y-YD
C-CD
YD
IC 203 ㊺ REC/PB
REC: 0.48
PB: 0.52
-(Y+C)
Y+C
PB Y
REC Y+C
DOC PULSE (IC101 ⑬)
DOC PULSE
D218
VA PB MODE (IC205 ⑬)
POWER SAVE (IC205 ④)
Q271,272 HALF TRAP SWITCH
ME/MP SYSCON (CN602 ⑫)
Q236
VIDEO 5V
REC 5V
REC CAM Y RF
H: 0.1µsec/div
V: 50mV/div
IC203 �59 REC
Q237,238 REC Y EQ
Q239 BUFFER
L220,221,231 C320,321,371 CHROMA/AFM BAND REJECTION
Q252 LINE REC Y BUFFER
RV209 REC Y
REC Y RF
VIDEO (2)
IC203 (1/4)
LIMITER
FM MOD
V/I CONV
V REG
RV204 CARSET
Q212 CLIP COMPEN
RV203 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
HPF
CLAMP
REC/PB Y
0.7Vp-p
JOG (IC205 ⑥)
REC 5V (Q236)
D210
Q209 (1/2)
IC203 ㉕ REC
TP207
PB RF (IQ162)
L213 C307 TRAP
L214,215 C308,309 AFM/ATF TRAP
Q233 BUFFER
L224,C331 CHROMA TRAP
Q245,Q215 SOFT LIMITER
Q246 LPF
Q248 FREQUENCY CHARACTOR SWITCH
JOG (IC205 ⑥)
JOG (CN501 ⑰)
DOC PULSE (IC205 ⑬)
Q249
Q231,232
VIDEO 5V
PB 5V
VA PB MODE (IC205 ⑬)
Q234 DELAY
Q235 LPF
PB C RF
LIMITER
BPF
LIMITER
FM DEMOD
LPF
EQ
RV202 PB Y LEVEL
Q213 EQ
Q214,222,223 HALF H SHIFT CANCEL
Q221 TRAP SWITCH
SP/LP (IC205 ⑭)
Q260,261 V REG BUFFER
V REG (IC203 ㉞)
RF SWP SERVO (IC601 ⑳)
CLAMP
MAIN DE-EMPHASIS
HPF
NOISE CANCEL
Q208 SUB EMPHASIS SWITCH
VA PB MODE (IC205 ③)
HPL
HPF
ATT
Y/C MIX
PB Y+C
Q228 PB VIDEO BUFFER
RV208 PB LEVEL
0.5Vp-p
RV210 REC C
IC203 ㉒, ㉓ PB
TP212
REC C RF
REC 5V (Q236)
Q241 REC C BUFFER
L222,223 C324,325 REC C EQ & AFM TRAP
Q253 LINE REC C BUFFER
H: 0.1µsec/div
V: 20mV/div
IC203 �60 PB
REC CAM C RF
0.25Vp-p
IC203 �57 PB
0.56Vp-p
IC203 �56 PB
0.3Vp-p
IC203 ④ PB
IC203 (1/4)
FL203 5.17MHz CF
4.32MHz
X201 4.43MHz
FSC (IC202 ㉓)
FSC
4.43MHz
REC 0.25Vp-p
PB 0.32Vp-p
IC203 ⑬ REC/PB
BID FF
PHASE INVERT
5.17MHz
0.2Vp-p
5.17MHz
IC203 ① REC/PB
PB C (4.43MHz)
REC/PB C
Q229
BURST FLAG GEN
Q208 CHROMA ATT


(See Page 183)
JK-63 BOARD
IC202
SC PLL
CCD CLOCK
CCD COMB FILTER
YD DELAY
CLAMP
CROSS TALK CANCEL
2H+YD DELAY
IC203 (45) REC/PB
IC203 (47) REC
IC203 (49) REC
REC 0.48Vp-p
PB 0.52Vp-p
0.48Vp-p
0.52Vp-p
0.5Vp-p
LPF
4.43MHz BPF
PB Y
PB C
REC Y+C
Y Vcc
IC201
BUFFER
Q205
3dB AMP
AGC AMP
AGC DET
CLAMP
SYNC SEP
SYNC OUT
CHARACTOR MIX
6dB AMP
VD INSERT
6dB
BUS DECODER
4.2V REG
Q204 AGC DISCHARGE
RV201
SYNC AGC
V MUTE (IC205 (11))
JOG VD SERVO (IC601 (76))
HD (IC204 (10))
JOG (IC205 (6))
DOC PULSE (IC101 (13))
Q242-244
D214
IC201 (11), (25) REC
IC201 (2) PB
IC201 (4) REC
IC201 (8) PB
0.4Vp-p
1Vp-p
PB IN
IN2
IN1
IN3
PB Y+C
LINE Y+C
Q206 CAMY BUFFER
L211, C301 CHROMA TRAP
Q230 EVF CHARACTER MIX
Q201-203 CURRENT LIMITER
VIDEO 5V
RF DC OUT
CN201
VIDEO IN
VIDEO OUT
DC OUT
CN205
VIDEO OUT
EVF (VF-40)
S921
INPUT
OUTPUT
J901
VIDEO INPUT/OUTPUT
E, Australian MODEL VIDEO IN/OUT
AEP, UK MODEL VIDEO OUT
RFU DC OUT
Q256, 259
V MUTE (IC206 (11))
W604
EVF W
DIGITAL TITLE (VC-80)
CN202
CAM Y
CAM C
REC CAM Y RF
REC CAM C RF
CAMERA (VC-80)
CAMERA REC (VC-80)
Q215, 216 CHROMA AMP
Q211 CHROMA MUTE
LINE REC+PB (Q226)
Q207
POWER SUPPLY FOR IC202
VIDEO 5V
Q206
D216
V MUTE (IC205 (11))
VA PB MODE (IC205 (13))
Q254
CAM/LINE (IC205 (7))
Q226
LINE REC+PB
REC CAM Y RF
IC203 (1/4)
N.C
VCO OUT
APC ADJ
L Vcc
C Vcc
Q258
SCK
CS
SO
BUS DECORDER
1/378
1/8
APC ID DET
AFC ID
AFC DET
378fH VCO
FL203 5.17MHz CF
4.32MHz
FREQ CONV
732KHz
4.43MHz
X201
FSC (IC202 (23))
4.43MHz VXO/XO
APC DET
IC203 (4) REC/PB
4.4Vp-p
RF SWP
RF SWP (SERVO) (IC601 (82))
ACK DET
BURST ID DET
SYNC DET
BID FF
PHASE INVERT
5.17MHz
PB FREQ CONV
ACC DET
FL202 PBC TRAP
PB C(4.43MHz)
4.43MHz REC 0.25Vp-p PB 0.32Vp-p
IC203 (13) REC/PB
0.2Vp-p
IC203 (1) REC/PB
REC/PB C
REC/PB C(4.43MHz)
Q229
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS(REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
ACC AMP
REC FREQ CONV
4.43MHz (REC C)
FL201 C EMPHASIS TRAP
TRAP FREQ SW Q209
VA PB MODE (IC205 (13))
0.3Vp-p
IC203 (4) PB
0.5Vp-p
IC203 (5) REC
0.1Vp-p
IC203 (3) PB
REC CAM C RF
IC205
EXPANTION PORT
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
Q255
VIDEO CS (IC601 (15))
COSMO SCK (IC601 (39))
COSMO SO (IC601 (38))
AUDIO STB (IC601 (16))
SYSTEM RESET (Q645)
REC LED
DEW LED
EDIT (W604 (5))
SYSCON
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-86)
JOG
SP/LP
VIDEO (2)

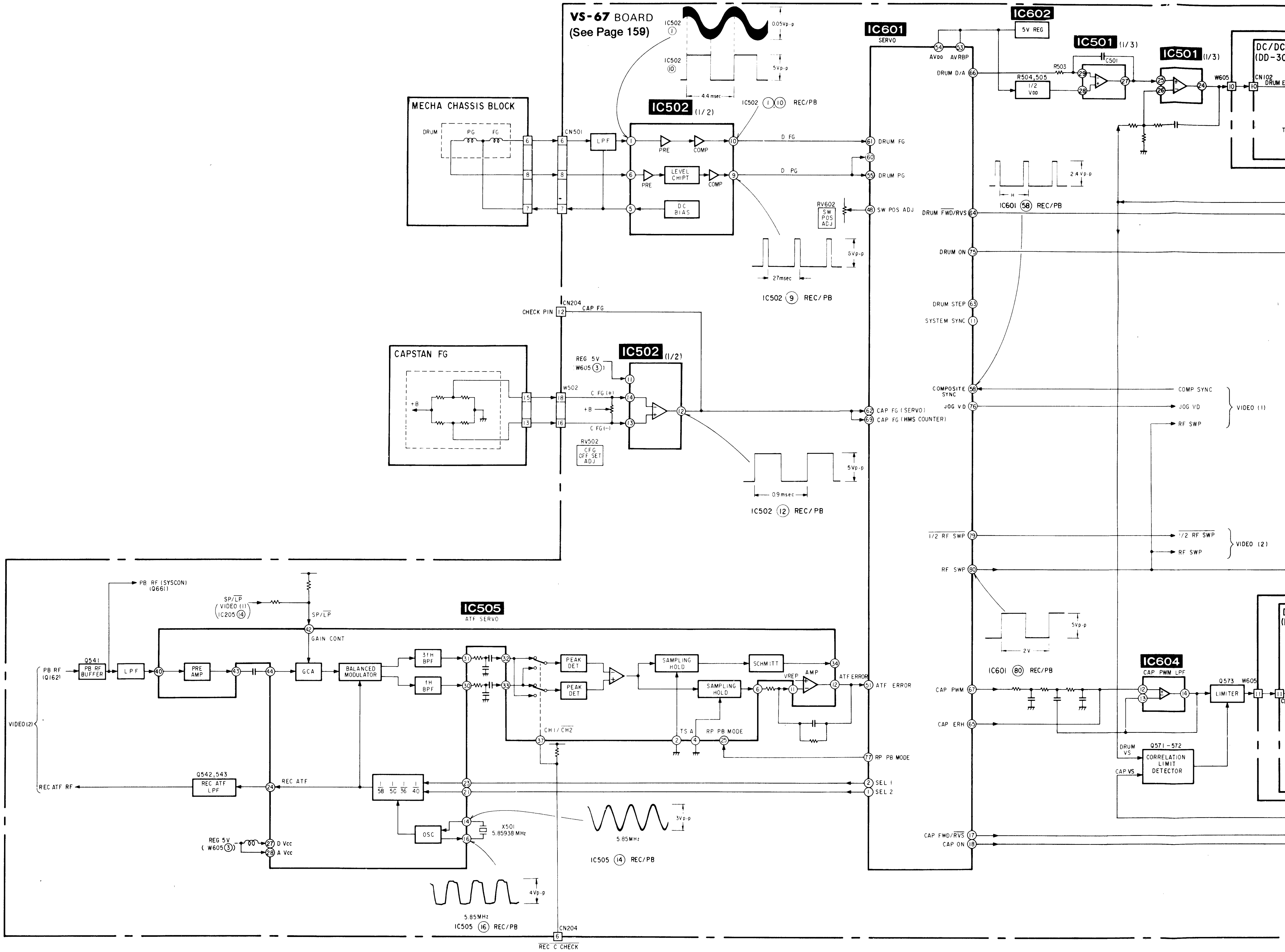
3-7. CAMERA REC BLOCK DIAGRAM

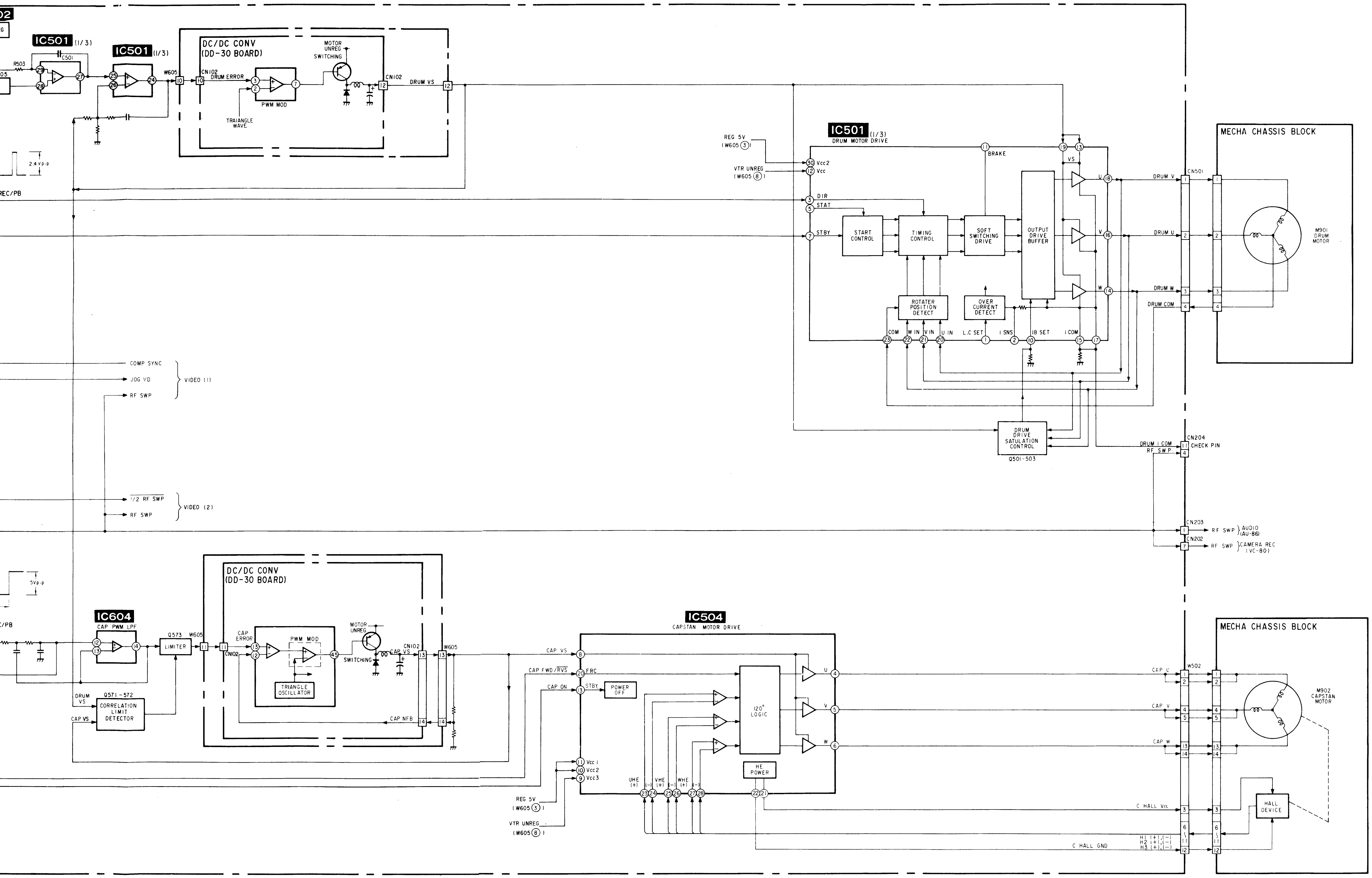

VC-80 BOARD (See Page 112)
IC503 ㉒, ㉕
㉒ 1Vp-p
㉕ 0.5Vp-p
H
IC503
PRE-EMPHASIS
FM MOD
FL503
CAM Y LPF
FL502
CAM Y DELAY
IC503 ⑰
0.68Vp-p
Q509
CLIP COMPENSAT
RF SWP
HALF H SHIFT
RV502
CARRIER
RV503
DEVIATION
MAIN EMPH TC
IC503 ⑭
V / 50mVdiv
H / 0.1μsecdiv
RV505
REC Y RF LEVEL
Q505
REC Y BUFFER
W303
REC CAM Y RF
CAM Y OUT(2)
CLAMP
KNEE & CAMERA WHITE CLIP
SUB EMPHASIS
MAIN EMPHASIS
V REG (4.2V)
DARK CLIP
WHITE CLIP
FM MOD
CAM 5V
Vcc
CAMERA
SUB EMPH TC
VIDEO(1) (VS-67)
RV501
CHROMA IN LEVEL
RV504
REC C RF LEVEL
Q504
REC C BUFFER
REC CAM C RF
CAM C OUT
BLK(2)
Q501,502
BURST EMPH
Q508
4.43MHz CHROMA BUFFER
IC502
CHROMA CONV
Q503
743kHz CHROMA AMP
CHROMA EMPHASIS
CHROMA AGC
MUTE
FL504
C.EMPH BPF
C AGC TC
IC141 (1/2)
CHROMA CONVERT CARRIER GENERATOR
PDO
PHASE DETECT
HD
SYNC GENERATOR
SC
1/375
1/2
PHASE INVERT
1/4
SCO O
VCO I
VCO O
LPF
D141
CT141
VCO ADJ
375 FH VCO
CAMERA BLOCK
IC501
L502, C502
732 kHz BPF
CARRIER CONV
FL501
5.17MHz BPF
RF SWP
SERVO (VS-67)
IC503 ①, ⑤
① 0.4Vp-p
⑤ 0.5Vp-p

3-8. VIDEO (2) BLOCK DIAGRAM

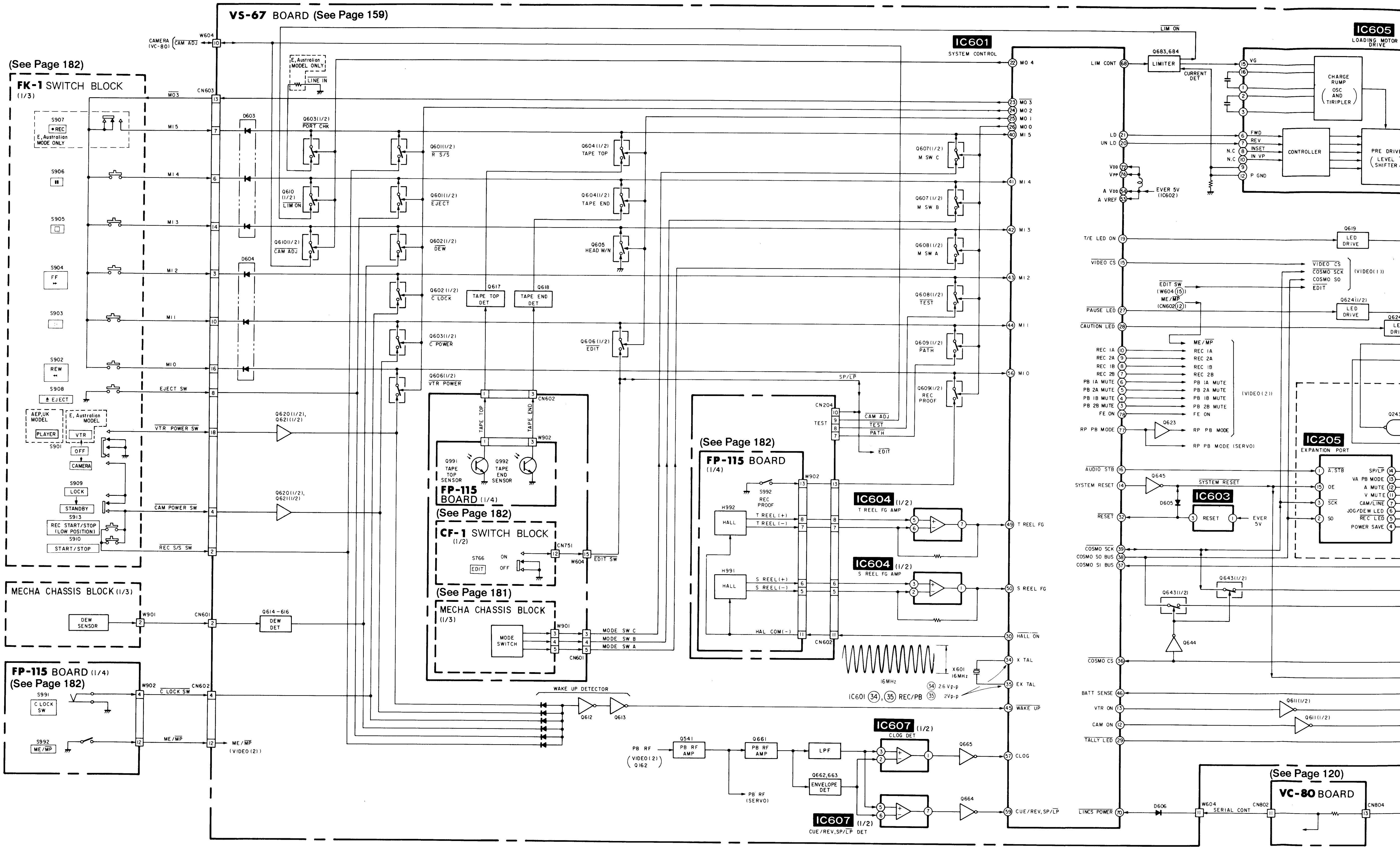

VS-67 BOARD
(See Page 155)
IC102
CH-1 REC/PB AMP
IC101
CH-2 REC/PB AMP
CN101
CN203
CN204
VIDEO HEAD CH-1A
VIDEO HEAD CH-1B
VIDEO HEAD CH-2A
VIDEO HEAD CH-2B
FLYING ERASE HEAD
Q105 CH-1A PB MUTING
Q106 CH-1B PB MUTING
Q107 CH-1A REC SW
Q108 CH-1B REC SW
Q102 CH-2A PB MUTING
Q101 CH-2B PB MUTING
Q104 CH-2A REC SW
Q103 CH-2B REC SW
Q166 REC Y PB MUTING
TP161
DUMPING
CH-1A REC AMP
CH-1B REC AMP
CH-2A REC AMP
CH-2B REC AMP
VCA
6dB AMP
9dB AMP
-6dB AMP
12dB AMP
BPF
MIDDLE TUNE
CH-1A HEAD AMP
CH-1B HEAD AMP
CH-2A HEAD AMP
CH-2B HEAD AMP
LOGIC CONTROL
ATF SW NORMAL
MULTI
PCM
MUTING
GCA
RF AGC DETECT
DOC DETECT
BUFFER
Q162
Q165 TIME CONSTANT SWITCH
Q164 TIME CONSTANT SWITCH
Q161 GAIN SWITCH
Q167
Q191,193 ERASE OSC
Q192 ERASE CURRENT SWITCH
RV101 REC C CH-1A
RV103 REC CH-1B
RV111 PB EQ CH-1A
RV113 PB EQ CH-2B
RV112 PB EQ CH-2A
RV114 PB EQ CH-2B
RV102 REC C CH-2A
RV104 REC C CH-2B
VIDEO 5V (W605 ②)
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
REC Y
REC 1A
REC 1B
REC 2A
REC 2B
PB 1A MUTE
PB 1B MUTE
PB 2A MUTE
PB 2B MUTE
REC AFM
REC C
SP/LP
REC ATF
RP PB MODE
RF SWP
1/2 RF SWP
IC101 ㊷
IC102 ㊷
PB 1A MUTE (IC601 ⑥)
REC 1A (IC601 ⑩)
SYSCON
REC Y RF (Q237 Ⓔ)
REC C RF (Q241 Ⓔ)
REC 1B (IC601 ⑧)
PB 1B MUTE (IC601 ④)
RP PB MODE (Q623)
SP/LP (IC205 ⑭)
VIDEO (1)
PB RF
JOG (IC205 ⑥)
DOC PULSE
RF SWP (IC601 ⑳)
SERVO
1/2 RF SWP (IC601 ⑲)
REC ATF (Q543)
PB 2A MUTE (IC601 ⑤)
REC 2A (IC601 ⑨)
ME/MP (CN602 ⑫)
REC 2B (IC601 ⑦)
PB 2B MUTE (IC601 ③)
FE ON (IC601 ⑱)
REC AFM RF
PB RF
AUDIO (AU-86)
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
TEST
PB RF CH-1
PB RF CH-2
V 5mv/div. H 0.1μsec/div.
Q166 Ⓒ REC
0.6Vp-p
2V
IC102 ⑯ PB
4.8Vp-p
IC101 ⑪ REC/PB
IC102 ⑪ REC/PB
2.7Vp-p
H
IC101 ㉘, ㉝ REC
IC102 ㉘, ㉝ REC

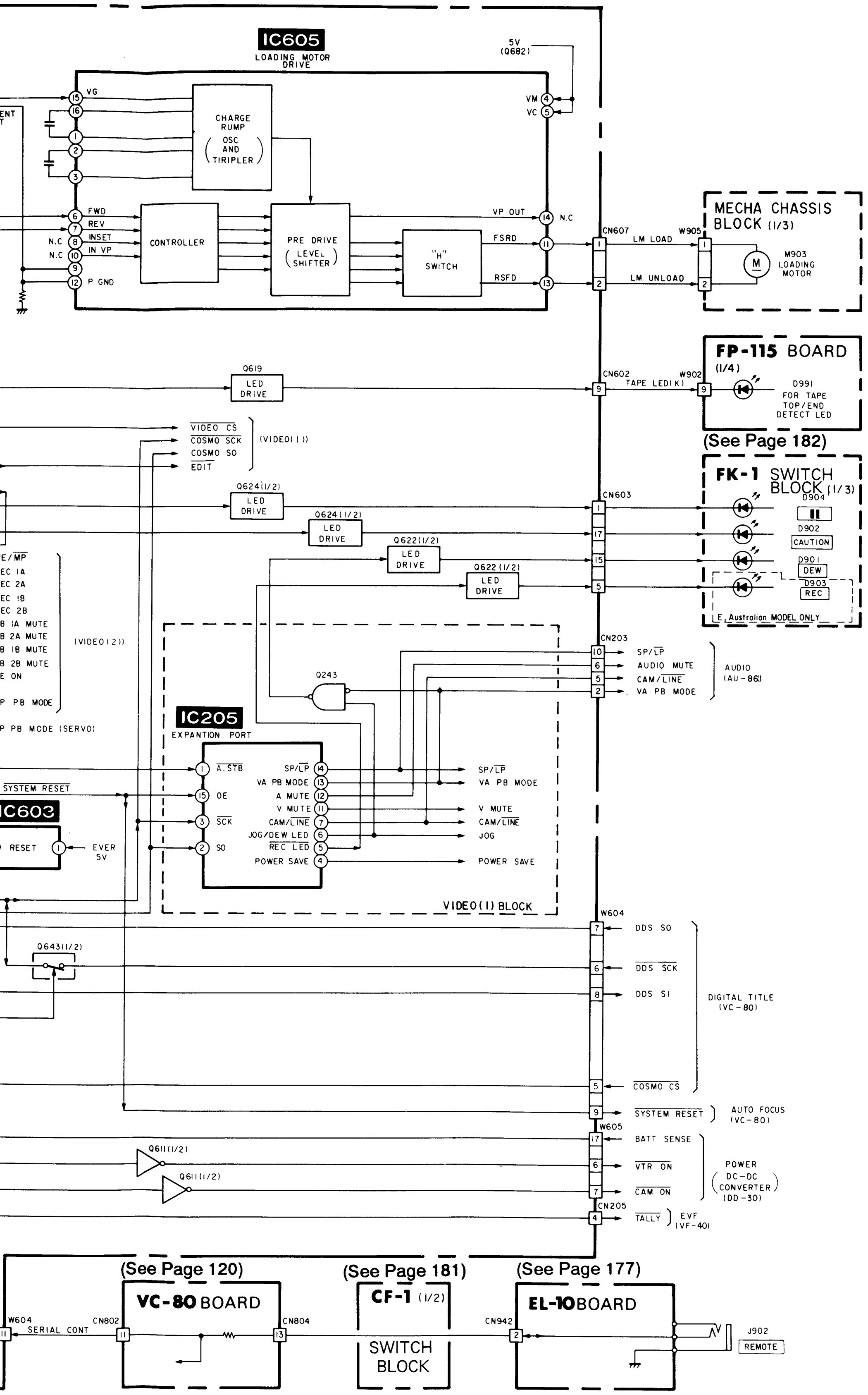
3-9. SERVO BLOCK DIAGRAM


VS-67 BOARD
(See Page 159)
MECHA CHASSIS BLOCK
DRUM
PG
FG
CN501
LPF
IC502 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
IC502 ① 0.05Vp-p
IC502 ⑩ 5Vp-p
4.4 msec
IC502 ①⑩ REC/PB
D FG
D PG
RV602 SW POS ADJ
5Vp-p
27msec
IC502 ⑨ REC/PB
CN204
CHECK PIN 12
CAP FG
CAPSTAN FG
+B
W502
REG 5V (W605 ③)
C FG (+)
C FG (−)
RV502 CFG OFF SET ADJ
IC502 (1/2)
5Vp-p
0.9msec
IC502 ⑫ REC/PB
IC601 SERVO
AVDD
AVRBP
DRUM D/A ⑯
DRUM FG ⑰
DRUM PG ㊺
SW POS ADJ ㊽
DRUM FWD/RVS ⑯
DRUM ON ⑲
DRUM STEP ⑬
SYSTEM SYNC ⑪
COMPOSITE SYNC ㊸
JOG VD ⑲
CAP FG (SERVO) ⑫
CAP FG (HMS COUNTER) ⑲
1/2 RF SWP ⑲
RF SWP ⑲
ATF ERROR ㊶
CAP PWM ⑯
CAP ERH ⑯
RP PB MODE ⑲
SEL 1
SEL 2
CAP FWD/RVS ⑰
CAP ON ⑱
IC602
5V REG
IC501 (1/3)
R503
C501
R504,505
1/2 VDD
IC501 (1/3)
W605
CN102
DRUM E
DC/DC
(DD-30
2.4Vp-p
H
IC601 ㊽ REC/PB
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
1/2 RF SWP
RF SWP
VIDEO (2)
5Vp-p
2V
IC601 (80) REC/PB
IC604
CAP PWM LPF
Q573
W605
LIMITER
DRUM VS
CAP VS
Q571-572
CORRELATION LIMIT DETECTOR
PB RF (SYSCON) (Q661)
SP/LP VIDEO (1) (IC205 ⑭)
SP/LP
IC505
ATF SERVO
GAIN CONT
VIDEO (2)
PB RF (Q162)
Q541
PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
PEAK DET
PEAK DET
SAMPLING HOLD
SCHMITT
SAMPLING HOLD
VREP
AMP
ATF ERROR
CH1/CH2
TS A
RP PB MODE
REC ATF RF
Q542,543
REC ATF LPF
REC ATF
1/58 1/50 1/36 1/40
OSC
X501 5.85938 MHz
REG 5V (W605 ③)
D Vcc
A Vcc
3Vp-p
5.85MHz
IC505 ⑭ REC/PB
4Vp-p
5.85MHz
IC505 ⑯ REC/PB
CN204
REC C CHECK


02
G
IC501 (1/3)
R503
C501
05
29
28
27
IC501 (1/3)
25
26
24
W605
10
DC/DC CONV
(DD-30 BOARD)
CN102
DRUM ERROR
3
2
7
PWM MOD
TRAIANGLE
WAVE
MOTOR
UNREG
SWITCHING
CN102
12
DRUM VS
2.4 Vp-p
REC/PB
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
1/2 RF SWP
RF SWP
VIDEO (2)
IC501 (1/3)
DRUM MOTOR DRIVE
REG 5V
(W605 ③)
VTR UNREG
(W605 ⑧)
30 Vcc2
12 Vcc
3 DIR
5 STAT
7 STBY
11 BRAKE
19
13
VS
START
CONTROL
TIMING
CONTROL
SOFT
SWITCHING
DRIVE
OUTPUT
DRIVE
BUFFER
U 18
V 16
W 14
ROTATER
POSITION
DETECT
OVER
CURRENT
DETECT
COM 23
W IN 22
V IN 21
U IN 20
L.C SET 1
I SNS 2
IB SET 10
I COM 15
17
DRUM
DRIVE
SATULATION
CONTROL
Q501-503
CN501
DRUM V
DRUM U
DRUM W
DRUM COM
MECHA CHASSIS BLOCK
M901
DRUM
MOTOR
CN204
DRUM I COM
RF SWP
CHECK PIN
CN203
RF SWP
AUDIO
(AU-86)
CN202
RF SWP
CAMERA REC
(VC-80)
5Vp-p
C/PB
IC604
CAP PWM LPF
12
13
14
Q573
LIMITER
W605
11
DRUM
VS
Q571-572
CORRELATION
LIMIT
DETECTOR
CAP VS
DC/DC CONV
(DD-30 BOARD)
CAP
ERROR
CN102
PWM MOD
45
TRIANGLE
OSCILLATOR
MOTOR
UNREG
SWITCHING
CN102
CAP VS
W605
CAP NFB
IC504
CAPSTAN MOTOR DRIVE
CAP VS 8
CAP FWD/RVS 20 FRC
CAP ON 13 STBY
POWER
OFF
11 Vcc 1
10 Vcc2
9 Vcc3
REG 5V
(W605 ③)
VTR UNREG
(W605 ⑧)
UHE (+) (−)
VHE (+) (−)
WHE (+) (−)
23 24 25 26 27 28
120°
LOGIC
HE
POWER
22 21
U 4
V 5
W 6
W502
CAP U
CAP V
CAP W
C HALL Vcc
H1 (+),(−)
H2 (+),(−)
H3 (+),(−)
C HALL GND
MECHA CHASSIS BLOCK
M902
CAPSTAN
MOTOR
HALL
DEVICE

3-10. SYSTEM CONTROL BLOCK DIAGRAM


VS-67 BOARD (See Page 159)
CAMERA (VC-80) CAM ADJ
W604
CN603
(See Page 182)
FK-1 SWITCH BLOCK (1/3)
S907 ●REC E, Australian MODE ONLY
S906
S905
S904 FF
S903
S902 REW
S908 ≜ EJECT
AEP,UK MODEL PLAYER
E, Australian MODEL VTR
S901 OFF CAMERA
S909 LOCK STANDBY
S913 REC START/STOP (LOW POSITION)
S910 START/STOP
MO3
MI5
MI4
MI3
MI2
MI1
MI0
EJECT SW
VTR POWER SW
CAM POWER SW
REC S/S SW
D603
D604
E, Australian MODEL ONLY
LINE IN
Q603(1/2) PORT CHK
Q610 (1/2) LIM ON
Q610(1/2) CAM ADJ
Q601(1/2) R S/S
Q601(1/2) EJECT
Q602(1/2) DEW
Q602(1/2) C LOCK
Q603(1/2) C POWER
Q606(1/2) VTR POWER
Q620(1/2), Q621(1/2)
Q617 TAPE TOP DET
Q618 TAPE END DET
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q605 HEAD W/N
Q606(1/2) EDIT
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
SP/LP
CN602
W902
TAPE TOP
TAPE END
Q991 TAPE TOP SENSOR
Q992 TAPE END SENSOR
FP-115 BOARD (1/4)
(See Page 182)
CF-1 SWITCH BLOCK (1/2)
S766 EDIT ON OFF
CN751
W604
EDIT SW
(See Page 181)
MECHA CHASSIS BLOCK (1/3)
MODE SWITCH
W901
CN601
MODE SW C
MODE SW B
MODE SW A
MECHA CHASSIS BLOCK (1/3)
DEW SENSOR
W901
CN601
Q614-616 DEW DET
FP-115 BOARD (1/4)
(See Page 182)
S991 C LOCK SW
S992 ME/MP
W902
CN602
C LOCK SW
ME/MP
ME/MP (VIDEO(2))
WAKE UP DETECTOR
Q612
Q613
CN204
TEST
CAM ADJ
TEST
PATH
EDIT
(See Page 182)
FP-115 BOARD (1/4)
S992 REC PROOF
H992 HALL
T REEL (+)
T REEL (−)
H991 HALL
S REEL (+)
S REEL (−)
HAL COM(−)
IC604 (1/2) T REEL FG AMP
IC604 (1/2) S REEL FG AMP
X601 16MHz
16MHz
IC601 ㉞, ㉟ REC/PB ㉞ 2.6 Vp-p ㉟ 2Vp-p
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
Q661 PB RF AMP
PB RF (SERVO)
LPF
Q662,663 ENVELOPE DET
IC607 (1/2) CLOG DET
Q665
Q664
IC607 (1/2) CUE/REV,SP/LP DET
IC601 SYSTEM CONTROL
MO4
MO3
MO2
MO1
MO0
MI5
MI4
MI3
MI2
MI1
MI0
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV, SP/LP
LIM ON
LIM CONT
Q683,684 LIMITER
CURRENT DET
LD
UN LD
VDD
VPP
A VDD
A VREF
EVER 5V (IC602)
T/E LED ON
VIDEO CS
EDIT SW (W604⑮)
ME/MP (CN602⑫)
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
Q623
RP PB MODE
RP PB MODE (SERVO)
(VIDEO(2))
AUDIO STB
SYSTEM RESET
Q645
SYSTEM RESET
D605
IC603 RESET
EVER 5V
RESET
COSMO SCK
COSMO SO BUS
COSMO SI BUS
Q643(1/2)
Q643(1/2)
Q644
COSMO CS
BATT SENSE
VTR ON
CAM ON
TALLY LED
Q611(1/2)
Q611(1/2)
LINCS POWER
D606
W604 SERIAL CONT
CN802
(See Page 120)
VC-80 BOARD
CN804
Q619 LED DRIVE
VIDEO CS
COSMO SCK
COSMO SO
EDIT
(VIDEO(1))
Q624(1/2) LED DRIVE
IC205 EXPANTION PORT
A STB
OE
SCK
SO
SP/LP
VA PB MODE
A MUTE
V MUTE
CAM/LINE
JOG/DEW LED
REC LED
POWER SAVE
IC605 LOADING MOTOR DRIVE
VG
CHARGE PUMP (OSC AND TRIPLER)
FWD
REV
INSET
IN VP
P GND
N.C
CONTROLLER
PRE DRIVE (LEVEL SHIFTER)


IC605
LOADING MOTOR DRIVE
5V (Q682)
VG
CHARGE RUMP (OSC AND TIRIPLER)
VM
VC
FWD
REV
INSET
IN VP
N.C
P GND
CONTROLLER
PRE DRIVE (LEVEL SHIFTER)
"H" SWITCH
VP OUT
FSRD
RSFD
CN607
W905
LM LOAD
LM UNLOAD
MECHA CHASSIS BLOCK (1/3)
M903 LOADING MOTOR
Q619
LED DRIVE
CN602
W902
TAPE LED(K)
FP-115 BOARD (1/4)
D991 FOR TAPE TOP/END DETECT LED
(See Page 182)
VIDEO CS
COSMO SCK
COSMO SO
EDIT
(VIDEO(1))
Q624(1/2)
Q622(1/2)
CN603
FK-1 SWITCH BLOCK (1/3)
D904
D902
CAUTION
D901
DEW
D903
REC
E, Australian MODEL ONLY
(VIDEO(2))
P PB MODE
P PB MODE (SERVO)
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-86)
Q243
IC205
EXPANTION PORT
A.STB
OE
SCK
SO
A MUTE
V MUTE
JOG/DEW LED
REC LED
POWER SAVE
JOG
SYSTEM RESET
IC603
RESET
EVER 5V
VIDEO(1) BLOCK
W604
DDS SO
DDS SCK
DDS SI
COSMO CS
DIGITAL TITLE (VC-80)
AUTO FOCUS (VC-80)
Q643(1/2)
W605
BATT SENSE
VTR ON
CAM ON
POWER (DC-DC CONVERTER) (DD-30)
Q611(1/2)
CN205
TALLY
EVF (VF-40)
(See Page 120)
VC-80 BOARD
SERIAL CONT
CN802
CN804
(See Page 181)
CF-1 (1/2)
SWITCH BLOCK
(See Page 177)
EL-10 BOARD
CN942
J902
REMOTE

3-11. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer μPD7503GF
- EVR microcomputer MC68HC05N4
- AF microcomputer MC68HC05C4

3-11-1. Mode/Mechanism Control Microcomputer CXP80116 (IC601 on VS-67 Board)

1. Function description

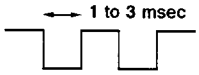
1) Power ON/OFF control
2) Key matrix read
   (Playback, Record, Fast-forward, Rewind, Pause, Stop, VIDEO/CAMERA Power, Eject, START/STOP)
3) Servo
4) Loading motor control
5) Error detection
   - Battery end/pre-end
   - Tape end
   - No cassette
   - Erasure prevention
   - DEW (condensation)
   - PAUSE release
   - CLOG (head clog)
   - L.MOTOR EMERGENCY
   - Drum rotation
   - Drum phase
   - Reel rotation
   - Capstan rotation
   - Drum/capstan start
6) H.M.S. counter
7) JOG VD insertion
8) Execution of various modes

2. Abbreviated specifications

- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microprocessor mode
- ROM: 16 Kbytes
- RAM: 352 Kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3. Terminal function (CXP80116)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">ATF REF PILOT signal frequency (f1 to f4) selecting signal. (*1)<table><tr><td>ATF REF PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF servo IC
(IC505: CXA1204Q)</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3</td><td>PB 2B MUTE</td><td>O</td><td colspan="2" rowspan="4">Crosstalk prevention control signal from the other heads during playback.
Mute by "H". (*1)</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>4</td><td>PB 1B MUTE</td><td>O</td></tr>
<tr><td>5</td><td>PB 2A MUTE</td><td>O</td></tr>
<tr><td>6</td><td>PB 1A MUTE</td><td>O</td></tr>
<tr><td>7</td><td>$\overline{\mathrm{REC\ 2B}}$</td><td>O</td><td colspan="2" rowspan="4">Drum head (1A, 2A, 1B, 2B) switching recording timing signal.
REC by "L". (*1).</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>8</td><td>$\overline{\mathrm{REC\ 1B}}$</td><td>O</td></tr>
<tr><td>9</td><td>$\overline{\mathrm{REC\ 2A}}$</td><td>O</td></tr>
<tr><td>10</td><td>$\overline{\mathrm{REC\ 1A}}$</td><td>O</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum servo. (*1)</td><td></td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">Camera DC/DC converter on/off signal. "H" when power of camera is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter on/off signal. "H" when power of camera or video is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Reset AF microcomputer during Power ON, and input to video/audio extension port (IC205) to mute audio signal during Power ON.</td><td>Pin ⑨ of IC612 and Pin (60) of IC613 on VC-80 board, Pin ⑮ of IC205 on VS-67 board.</td></tr>
<tr><td>15</td><td>$\overline{\mathrm{VIDEO\ CS}}$</td><td>O</td><td colspan="2">Selecting signal to video IC, CXA1200BQ and CXA1201Q of internal bus signal. Select by "L".</td><td>Pin ㉑ of IC201
Pin ⑰ of IC203</td></tr>
<tr><td>16</td><td>$\overline{\mathrm{AUDIO\ STB}}$</td><td>O</td><td colspan="2">Data strobe signal to video/audio extension port (IC205) of internal bus communication. Latch by _|‾.</td><td>Pin ① of IC205</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\mathrm{RVS}}$</td><td>O</td><td colspan="2">Capstan rotation direction control signal.
FWD by "H", RVS by "L". (*1)</td><td>Pin ⑳ of IC504</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Capstan driver ON control signal. Capstan ON by "H". (*1)</td><td>Pin ⑬ of IC504</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">TAPE top/end LED driving signal.</td><td>Q619Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Loading motor control signal<table><tr><td>Conditions / Signals</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td>Pin ⑦ of IC605</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td><td>Pin ⑥ of IC605</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Only Matrix output $\overline{\mathrm{MO3}}$ is "L" active.
Only $\overline{\mathrm{MO3}}$ is "L" pulse output, the other ports are "H" pulse output.</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\mathrm{MO3}}$</td><td>O</td></tr>
<tr><td>24</td><td>MO2</td><td>O</td></tr>
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\mathrm{PAUSE\ LED}}$</td><td>O</td><td>PAUSE LED control signal. "L" when PAUSE LED is lit.</td><td rowspan="3">Middle withstand voltage (12V), Large current (12 mA) port.</td><td>Pin ② of Pause LED driver Q624</td></tr>
<tr><td>28</td><td>$\overline{\mathrm{CAUTION\ LED}}$</td><td>O</td><td>CAUTION LED control signal. "L" when CAUTION LED is lit.</td><td>Pin ⑤ of Caution LED driver Q624</td></tr>
<tr><td>29</td><td>$\overline{\mathrm{TALLY\ LED}}$</td><td>O</td><td>External TALLY LED and EVF internal TALLY drive. "L" when TALLY LED is lit.</td><td>TALLY LED</td></tr>
</table>

Pin No.	Signal Name	I/O	Function	Connection
30	$\overline{\text{HALL ON}}$	O	Reel FG hole element. Drive, middle withstand voltage and large current port. 	Reel sensor
31	MP	I	Microcomputer processor mode selecting pin → unselecting.	GND
32	$\overline{\text{RESET}}$	I	Reset input. "L" active.	Pin ③ of reset IC IC603
33	V_{SS}		GND	GND
34	XTAL	O	Crystal connecting pin for system clock oscillation. Oscillation at: 16 MHz.	Oscillation crystal X601
35	EXTAL	I		
36	$\overline{\text{COSMO CS}}$	I	Selecting signal from DDS microcomputer of internal bus communication to mode/mechanism control. Selected by "L".	DDS microcomputer Pin ⑭ of IC561 on VC-80 board
37	COSMO SI BUS	I	Serial data input pin.	
38	COSMO SO BUS	O	Serial data output pin.	
39	$\overline{\text{COSMO SCK}}$	I/O	Input/output pin for serial clock.	
40	MI 5	I	Matrix input.	
41	MI 4			
42	MI 3			
43	MI 2			
44	MI 1			
45	$\overline{\text{WAKE UP}}$	I	STBY release input. Released by "L".	
46	BATT SENSE	I	Battery end/pre-end voltage input. A/D input pin.	Inside BATT END ADJ (DD-30 board RV101)
47	N.C.			
48	SW POS ADJ	I	Switching position adjustment input (Test mode). A/D input pin	SW POS ADJ RV602
49	T REEL FG	I	T-reel/S-reel FG input. A/D input pin.	Pin ⑦ of IC604
50	S REEL FG	I		Pin ① of IC604
51	ATF ERROR	I	ATF error (ATF LOCK error)input. A/D input pin.	Pin ⑫ of ATF IC IC505
52	AV_{SS}		A/D converter GND pin.	GND
53	AV_{REF}	I	A/D converter reference voltage input pin	Pin ① of regulator IC IC602 for EVER 5V
54	AV_{DD}		A/D converter positive power supply pin	
55	DRUM PG	I	DRUM PG input. FRC (High precision timer)capture input pin.	Pin ⑨ of Sense amp IC502
56	MI 0	I	Matrix input	
57	CLOG	I	Clog detection signal input. Clog by "H".	Q665 Ⓒ
58	COMPOSITE SYNC	I	Composite sync signal input (Incorporated V SYNC separator)	Pin ⑭ of VIDEO IC IC201
59	CUE/REV SP/$\overline{\text{LP}}$	I	SP/LP discrimination signal input when CUE/REV, etc. "H" when SP mode, "L" when LP mode.	Q664 Ⓒ
60	DRUM PG	I	Not used.	Pin ⑨ of Sense amp IC502
61	DRUM FG	I	DRUM FG input pin. FRC capture input pin.	Pin ⑩ of Sense amp IC502
62	CAP FG	I	CAPSTAN FG input pin. FRC capture input pin.	Pin ⑫ of Sense amp IC502

Pin No.	Signal Name	I/O	Function	Connection
63	DRUM STEP	O	Not used.	
64	DRUM $\overline{\text{FWD}}$/RVS	O	DRUM rotation direction control signal. RVS by "H", FWD by "L".	Pin ③ of IC501
65	CAP ERH	O	H level output pin to set capstan error to maximum level when capstan start and stop.	Pin ⑫ of IC604
66	DRUM D/A	O	DA gate pulse output pin to output DRUM error. Exclusive servo output pin (DA mode).	
67	CAP PWM	O	PWM output pin servo exclusive output pin to output cap error (PWM mode)	
68	LIM CONT	O	Loading motor current limiter control signal so as to prevent fingers from being nipped. Limiter ON by "H".	
69	CAP FG	I	External event input pin to Cap FG input pin exclusive counter for Tape counter drive	Pin ⑫ of Sense amp IC502
70	$\overline{\text{LINCS POWER}}$	I	Input to release microcomputer standby to turn on the unit from external with remote commander.	Remote jack Pin ② of J902 on EL-10 board
71	$\overline{\text{NMI}}$	I	Non-maskable interrupt request pin. NMI is not used.	EVER 5V
72	V_{DD}		Positive power supply pin	EVER 5V
73	V_{SS}		GND pin.	GND
74	V_{PP}		N.C.	EVER 5V
75	DRUM ON	O	DRUM driver ON control signal.	Pin ⑦ of IC501
76	JOG VD	O	Insert to VIDEO signal when variable speed playback. Simulated VD output pin. (*1)	Pin ⑤ of IC201
77	RP PB MODE	O	Switching signals for REC/PB amplifier and REC/PB mode of ATF IC. (*1)	ATF IC Pin ㉕ of IC505 REC/PB amp (IC101, IC102)
78	$\overline{\text{FE ON}}$	O	Flying erase oscillation ON/OFF signal. Oscillating by "L". (*1)	Flying erase oscillation circuit
79	$\overline{\text{1/2 RF SWP}}$	O	1/2 RF SWP output pin. (*1)	REC/PB amp
80	RF SWP	O	RF SWP output pin. (*1)	REC/PB amp Video system

*1: High precision real time pattern output and high precision real time pulse output terminal

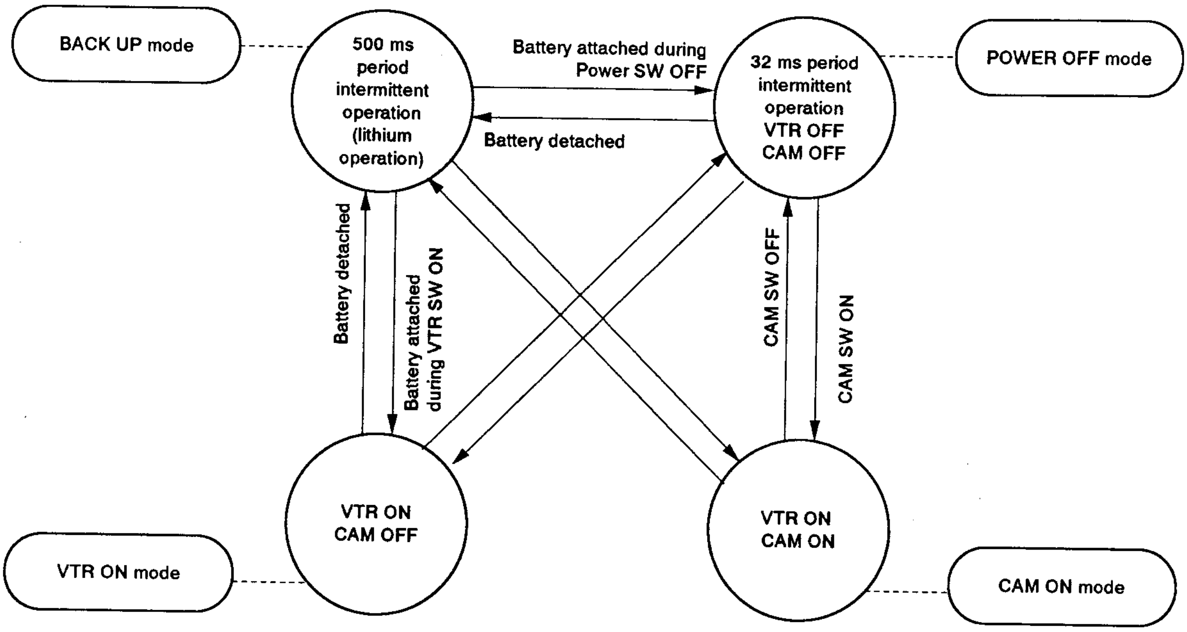
3-11-2. DDS microcomputer µPD7503GF (IC561 on VC-80 Board)

1. Function description

1) Internal data communication control
2) Date/time measurement
3) LCD indication
4) Reading of key matrix
(White balance, shutter speed, edit search +/–, auto-lock, focus, counter reset, zero memory, superimpose on/off, memory, color/mode, backlight, date (+), time (next), fader)

2. Operation modes

- As shown in the chart below, the operation mode is shifted according to the position of the power switch (CAMERA/OFF/PLAYER or VTR) and whether or not there is a main battery.


BACK UP mode
500 ms period intermittent operation (lithium operation)
Battery attached during Power SW OFF
Battery detached
32 ms period intermittent operation VTR OFF CAM OFF
POWER OFF mode
Battery detached
Battery attached during VTR SW ON
CAM SW OFF
CAM SW ON
VTR ON CAM OFF
VTR ON CAM ON
VTR ON mode
CAM ON mode

- **The main DDS microcomputer functions in each mode is as follows.**

Mode	Main Battery	Power Switch	Microcomputer power supply	Clock Mode	Indication		Main Functions
					LCD	EVF	
BACK UP	No	CAMERA/ OFF/ PLAYER (or VTR)	LI 3V (Lithium battery)	500 ms period intermittent oscillation	–	–	• Backup of title and tape counter data • Clock count operation
POWER OFF	Yes	OFF	EVER 5V (Main battery)	32 ms period intermittent oscillation	○	–	• Counter/date/time indication to LCD • Date/time set function (Zero memory and counter reset are invalid.)
VTR ON	Yes	PLAYER (or VTR)	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	–	• Serial communication with EVR and mode/mechanism control microcomputer • Indication to LCD • Acceptance of zero memory and counter reset keys
CAM ON	Yes	CAMERA	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	○	• VTR ON functions and all camera features • Indication control for white balance, focus, titles, electronics shutter, etc. • Indication to EVF and LCD

3. Terminal function and input/output level (μPD7503GF)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	——	–	
2	$\overline{\text{CMO 2}}$	O	Key matrix output signal. "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
3	$\overline{\text{CMO 1}}$	O	
4	$\overline{\text{CMO 0}}$	O	
5	DDS SI	I	Serial communication and data input. V period "L" pulse train.
6	DDS SO	O	Serial communication and data output. V period "H" pulse train.
7	$\overline{\text{DDS SCK}}$	I/O	Serial communication and serial clock input/output. V period "L" pulse train.
8	$\overline{\text{TEST}}$	I	Test mode input. Normally "H".
9	$\overline{\text{LI PE}}$	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
10	VTR PWR	I	SS 5V power detection. "H" when power on.
11	CG BUSY	I	Busy signal input from character generator. Not used.
12	CMO 4	O	Key matrix output signal. "H" pulse of 22 ms (VTR mode) or 1V period (camera mode).
13	$\overline{\text{EVR CS}}$	O	Chip select signal to EVR microcomputer (IC361 on VC-80 board). "L" pulse of 1V period.
14	$\overline{\text{COSMO CS}}$	O	Chip select signal to servo/system control microcomputer (IC601 on VS-67 board). "L" pulse of 1V period.
15	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
16	TG CS	O	Not used.
17	SRAM CS	O	Chip select signal to static RAM (IC801 on TI-30 board). VTR mode: "L" Camera mode: Normally "L". "H" during title operation.
18	TITLE CS	O	Chip select signal to title controller (IC802 on TI-30 board). VTR mode: "L" Camera mode: "H" pulse of 1V period.
19	LCD OFF	O	LCD indication ON/OFF control output. Normally "L" (0V). "H" (3V) when backed up by lithium battery.
20	X2	O	Crystal oscillation circuit for clock. Oscillation frequency is 32.768 kHz
21	X1	I	
23	VLC 3	I	LCD power supply 3 input pin. Normally 0V. 3V when backed up.
24	VLC 2	I	LCD power supply 2 input pin. Normally 1.7V. 3V when backed up.
25	VLC 1	I	LCD power supply 1 input pin. Normally 3.3V. 3V when backed up.
26	VDD	I	Power supply input pin.
27	COM 3	O	LCD remote control pin driving output 3. 4 values outputs of 0, 1.7, 3.3, 5V.
28	COM 2	O	LCD remote control pin driving output 2.
29	COM 1	O	LCD remote control pin driving output 1.
30	COM 0	O	LCD remote control pin driving output 0.

Pin No.	Signal Name	I/O	Functions and I/O Level
31		I	
32 to 40	——	I	Not used
41 to 54	S13 to S0	O	LCD segment pin driving output, 13 to 0. 4 values outputs of 0, 1.7, 3.3, 5V.
55	INT 1	I	Interrupt input by camera VD. VTR mode: "H". Camera mode: "H" pulse of 1V period.
56	RESET	I	Normally "L".
57	CL 1	I	System clock oscillation pin. • When video power ON or camera power ON: Continuous oscillation (Oscillation frequency: approx. 330 kHz). • When power OFF: 32 ms period intermittent oscillation (Oscillation frequency: approx. 330 kHz) • When backed up by lithium battery: 500 ms period intermittent oscillation (Oscillation frequency: approx. 70 kHz)
59	CL 2	I	
58	VDD	O	Power supply input pin.
60	CMI 3	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
61	CMI 2	I	
62	CMI 1	I	
63	CMI 0	I	
64	$\overline{\text{COM 3}}$	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).

3-11-3. EVR microcomputer MC68HC05N4 (IC361 on VC-80 Board)

1. Function description

1) EVR control
2) Auto white balance control
3) Electronic shutter

2. Pin function and input/output level (MC68HC05N4)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	——		——
2	$\overline{\text{SSW}}$	O	"H" only during communicating with serial switching D/A converter. "H" pulse of V period.
3	$\overline{\text{SCLK}}$	O	Serial clock output. V period "L" pulse train.
4	SI	I	Serial data input. V period "H" pulse train.
5	SO	O	Serial data output. V period "L" pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. "L" pulse of V period.
7	L IN	I	LANC input. L: 0, H: 1. V period "H" pulse train.
8	L OUT	O	LANC output. L: 0, H: 1. V period "H" pulse train.
9	$\overline{\text{CAM ADJ}}$	I	NORMAL/ADJUST selection. Normally "H". "L" during adjustment.
10		O	
11	SSW	O	Serial signal switching. "L" pulse of V period.
12, 13	LD	O	Data load instruction to EVR (IC252, IC302). "H" pulse of V period.
14	$\overline{\text{BACK LIGHT}}$	O	"L" during backlight compensation ON.
15	IRIS I/O	I	Control from AF microcomputer, Indoor (IN): H, outdoor (OUT): L according to brightness.
16	——		
17	VDD		Connected to EVER 5V.
18			GND
19	——	–	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcast system selection. L: NTSC, H: PAL.
21	TG STB	O	Storobe signal to TIMING GENERATOR. "L" pulse of V period.
22	GND		——
23	GND		——
24, 25	GND		——
26	GND	–	——
27	GND	–	——
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally 2V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally "L". "H" during auto white balance adjustment.
31	——	–	NC
32	——	–	——
33	——	–	——
34	S3SW	O	AWB measurement signal selection. "H" pulse of 3V period.
35	S2SW	O	AWB measurement signal selection. "H" pulse of 3V period.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. "H" pulse of V period.
37	——	–	——
38	S1SW	O	AWB measurement signal selection. "H" pulse of 3V period.
39	——	–	——
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	VDD		Connected to EVER 5V.
43	——		——
44	$\overline{\text{RESET}}$		Normally "H". "L" when reset.
45	$\overline{\text{IRQ}}$		Connected to $\overline{\text{EVR CS}}$ signal. "L" pulse of V period.
46	——	–	Normally "H". "L" when reset.
47	——	–	Normally "H". "L" when reset.
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Normally "H". "L" for 7V period when title store button is (S762 on CF-1 board) pressed.

3-11-4. AF microcomputer MC68HC05C4 (IC613 on VC-80 Board)

1. Function description

1) AF control
2) Power focus
3) Zoom motor drive

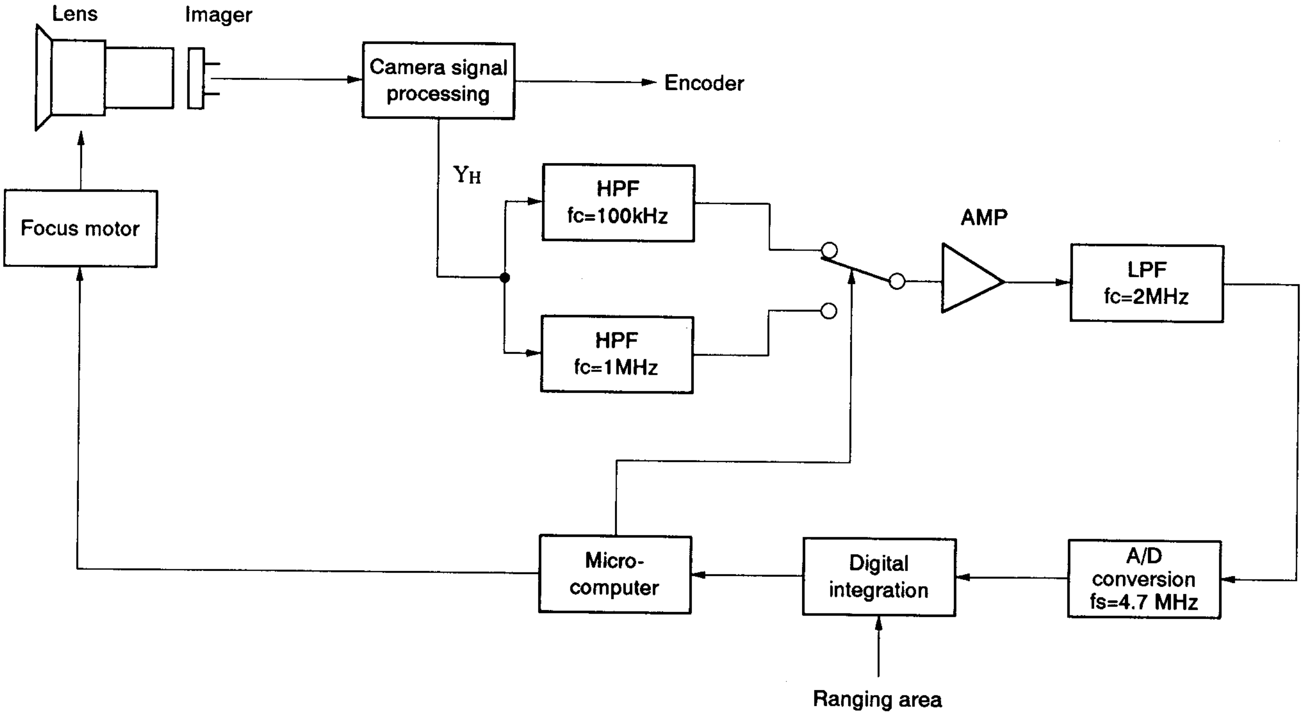
2. Auto focus system of this unit
(Λ -AF: Image processing system)

The high frequency components of video signal (actually luminance signal) are microcomputer processed by TTL without using external sensors to control the focus).

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance (Y) signal, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases


Lens
Imager
Camera signal processing
Encoder
Focus motor
YH
HPF fc=100kHz
HPF fc=1MHz
AMP
LPF fc=2MHz
Micro-computer
Digital integration
A/D conversion fs=4.7 MHz
Ranging area

4. Pin function and input/output level (MC68HC05C4)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	$\overline{\text{SS}}$ OUT	O	EVR data read timing output (PD5 SS input). V period "L" pulse train.
2	IRIS I/O	O	Indoors/outdoors determination according to aperture value. "H" for indoors and "L" for outdoors.
3	LED CONT	O	Focus position detect LED drive signal. V period "H" pulse.
4			
5			
6	$\overline{\text{MACRO}}$	O	Signal to DDS microcomputer (IC561 on VC-80 board). "L" when zoom ring is at MACRO position.
7	———	–	
8			Not used.
9	———	–	
10	———	–	
11	$\overline{\text{ZOOM T}}$	O	Normally "H". "L" when zoom motor is rotated in telephoto direction.
12	$\overline{\text{ZOOM W}}$	O	Normally "H". "L" when zoom motor is rotated in wide angle direction.
13	Focus N	O	Normally "L". "H" when focus motor is rotated in far range direction.
14	———	–	
15	Focus F	O	Normally "L". "H" when focus motor is rotated in close range direction.
16	F SPD ϕ	O	Not used.
17	———	–	
18	F SPD1	O	Not used.
19	F SPD2	O	Not used.
20	———	–	
21	F SPD3	O	Not used.
22	———	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	———	–	
26	$\overline{\text{F SENS 1}}$	I	Focus position detection signal. V period "H" pulse when focus ring is between about 1.3m and 3m.
27	———	–	
28	WINDOW	O	Auto focus window signal. V period "H" pulse.
29	———	–	
30	$\overline{\text{F SENS 2}}$	I	Focus position detection signal. V period "H" pulse when focus ring is between about 2m and ∞ .
31	AF SSW	O	Timing output for bus selection. "H" pulse of V period.
32	———	–	
33	DA STB	O	D/A converter for AF. For data latch. V period "H" pulse train.
34	PAL/$\overline{\text{NTSC}}$	I	PAL/NTSC selection.
35	———	–	
36	$\overline{\text{J STB}}$	O	External display jig. For data latch. "L" pulse of V period.
37	XCS	O	Active "L" for communication request to IC612 CXD-1204. "L" pulse of V period.
38	PD0	I	Connected to VDD.
39	———	–	
40	PD1	I	Connected to VDD.
41	MISO	I/O	SPI MASTER: in...SLAVE: out...V period "H" pulse train.
42	MOSI	I/O	SPI MASTER: out...SLAVE: in...V period "L" pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI SERIAL CLOCK. V period "L" pulse train.
44	———	–	

Pin No.	Signal Name	I/O	Functions and I/O Level
45	$\overline{\text{SS}}$	I	V period “L” pulse train.
46	———	–	
47	———	–	
48	$\overline{\text{EVR CS}}$	I	EVR data communication request ↓ from DDS microcomputer. “L” pulse of V period.
49	———	–	
50	———	–	
51	$\overline{\text{Focus FG}}$	I	Interrupt generation by Focus motor FG ↓ . “L” when auto focus OFF. “H” pulse of period according to focus motor rotation speed when auto focus ON.
52	CLK OUT	O	Waveform shaped output of Pin (54) clock (1.77 MHz)
53	———	–	
54	CLK IN	I	External clock input. 14.2 MHz clock input to Pin ㉘ of IC612 is divided by 8 input.
55	VDD		CAM 5V
56	———	–	
57	———	–	
58	———	–	
59	———	–	
60	$\overline{\text{SYS RST}}$	I	Normally “H”. “L” when resetting.
61	AREA	I	Interrupt generation by ↓ from CXD-1204 (IC612). V period pulse
62	VPP		CAM 5V
63	———	–	
64	———	–	

3-12. INTERFACE

3-12-1. System Control — Video Audio Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	*13 REC	*13 REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	Pin ⑭ of IC205 on VS-67 board	1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*14	*14	*14	*14	*2	*2	H	H
VA PB MODE	O	Pin ⑬ of IC205 on VS-67 board	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE	O	Pin ⑫ of IC205 on VS-67 board	L	L	L	H	H	L*3	H	H	H	H	H	L	L	L	L	H	H	L	H
VIDEO MUTE	O	Pin ⑪ of IC205 on VS-67 board	L	L	L	L	L	L*3	L	L	L	L	L	L	L	L	L	L	L	L	L
CAM/$\overline{\text{LINE}}$	O	Pin ⑦ of IC205 on VS-67 board	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H
JOG/DEW LED	O	Pin ⑥ of IC205 on VS-67 board	L*4	L	L	H	H	L	H	H	H	H	H	L	L	L	L	L	H	L	H
$\overline{\text{REC LED}}$	O	Pin ⑤ of IC205 on VS-67 board	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H	H	H
POWER SAVE	O	Pin ④ of IC205 on VS-67 board	H	H	H	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
JOG VD	O	Pin (76) of IC601 on VS-67 board	L	L	L	*5	*5	H	*5	*5	*5	*5	*5	L	L	L	L	L	*5	L	*5
RP PB MODE	O	Pin (77) of IC601 on VS-67 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	Pin (78) of IC601 on VS-67 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{1/2 RF SWP}}$	O	Pin (79) of IC601 on VS-67 board	H/L	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RF SWP	O	Pin (80) of IC601 on VS-67 board	H/L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
PB 2B MUTE	O	Pin ③ of IC601 on VS-67 board	H/L	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	L	L	L	L	*8	*8	*8	*8
PB 1B MUTE	O	Pin ④ of IC601 on VS-67 board																			
PB 2A MUTE	O	Pin ⑤ of IC601 on VS-67 board																			
PB 1A MUTE	O	Pin ⑥ of IC601 on VS-67 board																			

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SERACH		PB• PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
REC2B	O	Pin ⑦ of IC601 on VS-67 board	H/L	H	H	H	H	H	H	H	H	H	H	*9	H	H	*9	H	H	H	H
REC1B	O	Pin ⑧ of IC601 on VS-67 board																			
REC2A	O	Pin ⑨ of IC601 on VS-67 board																			
REC1A	O	Pin ⑩ of IC601 on VS-67 board																			
$\overline{\text{VIDEO CS}}$	O	Pin ⑮ of IC601 on VS-67 board	"L" pulse of V period.																		
$\overline{\text{AUDIO STB}}$	O	Pin ⑯ of IC601 on VS-67 board																			
COSMO SO	O	Pin ㊳ of IC601 on VS-67 board	V period pulse train.																		
$\overline{\text{COSMO SCK}}$	I/O	Pin ㊴ of IC601 on VS-67 board																			
CUE/REV SP/$\overline{\text{LP}}$	I	Pin (59) of IC601 on VS-67 board	H	*10	*10	*10	*10	L	*10	*10	*10			H	H/L	H/L	H	L	*10	L	*10
CLOG	I	Pin (57) of IC601 on VS-67 board	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H			H	*11	*11	*11
COMPOSITE SYNC	I	Pin (58) of IC601 on VS-67 board	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs the determination result of last mode. SP mode "H", LP mode "L".

*2. Outputs the determination result of recording mode of playback tape.
SP mode "H", LP mode "L".

*3. "H" at non signal portion of tape

*4. "H" after mode shift completion during dew condensation generation.

*5. Simulated VD signal

*6. 12.5 Hz duty 50% pulse (synchronized to drum rotation)

*7. 25 Hz duty 50% pulse (synchronized to drum rotation)

*8. See timing chart 6.

*9. See timing chart 7.

*10. "H" at SP recording portion of tape, "L" at LP recording portion.

*11. "H" at non recording portion of tape, or drop-out portion. Head clog detection input.

*12. Composite sync signal input (polarity=+) separated from line input video signal, camera video signal, or playback video signal.

*13. Effectively for the model installed REC switch.

*14. According to the REC MODE switch position.
"H" when the SP position, "L" when the LP position.

3-12-2. System Control — Servo Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB·PAUSE	FRAME	SLOW	*19 REC	*19 REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
T.REEL FG	I	Pin ㊾ of IC601 on VS-67 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	Pin ㊿ of IC601 on VS-67 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	Pin (51) of IC601 on VS-67 board	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	Pins (55) and (60) of IC601 on VS-67 board	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	Pin (61) of IC601 on VS-67 board	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG	I	Pins (62) and (69) of IC601 on VS-67 board	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	Pin ⑱ of IC601 on VS-67 board	L	H	H	H	H	H	H	H	L	*15	*15	H	L	L	H	H	H	H	H
SEL 2	O	Pin ① of IC601 on VS-67 board	H	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	H	H	*6	*8	*11	*8	*11
SEL 1	O	Pin ② of IC601 on VS-67 board	L	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	L	L	*6	*8	*11	*8	*11
DRUM STEP *12	O	Pin (63) of IC601 on VS-67 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM $\overline{\text{FWD}}$/RVS *13	O	Pin (64) of IC601 on VS-67 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CAP ERH *14	O	Pin (65) of IC601 on VS-67 board	–	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	*15	*15	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ
DRUM D/A	O	Pin (66) of IC601 on VS-67 board	–	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16
CAP PWM	O	Pin (67) of IC601 on VS-67 board	–	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17
LIM CONT *18	O	Pin (68) of IC601 on VS-67 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON	O	Pin (75) of IC601 on VS-67 board	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

*1. Pulse is input by reel rotation.

*2. ATF error voltage input.

*3. 1 PG pulse is input with 1 rotation of drum. Approx. 37.5 Hz.

*4. 6 FG pulses are input with 1 rotation of drum. Approx. 225 Hz.

*5. 360 FG pulses are input with 1 rotation of capstan. Approx. 1145.5 Hz during REC/PB (SP).

*6. See timing chart 1.

*7. See timing chart 2.

*8. See timing chart 3.

*9. See timing chart 5.

*10. See timing chart 5.

*11. See timing chart 4.

*12. Not used.

*13. Normally "L". "H" temporarily only when loading/unloading (Drum inverts.)

*14. Normally HIZ (High impedance). "H" during start and stop of capstan

*15. "H" pulse when tape is advanced.

*16. "H" pulse/"L" pulse output as center level HIZ (2.5 Vdc).

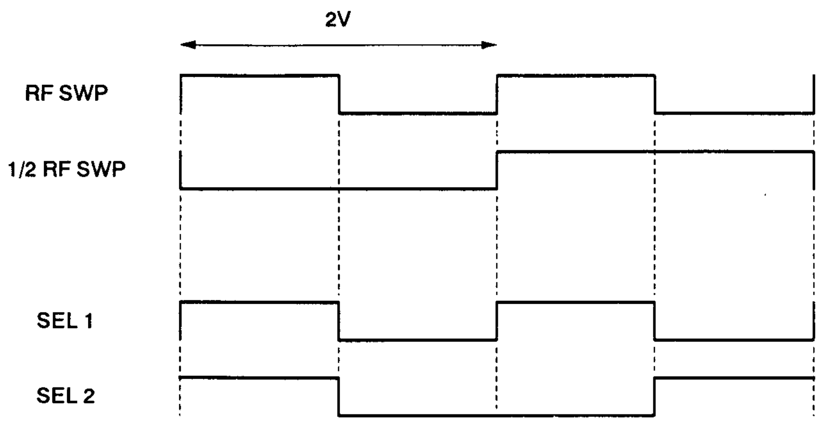
*17. 64 μsec sync PWM signal

*18. "H" when cassette loading.

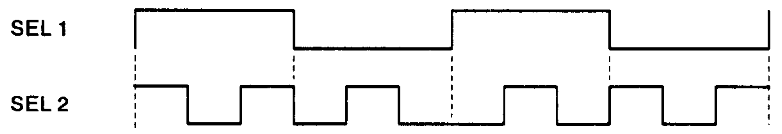
*19. Effectively for the model installed REC switch.

3-12-3. Timing Chart

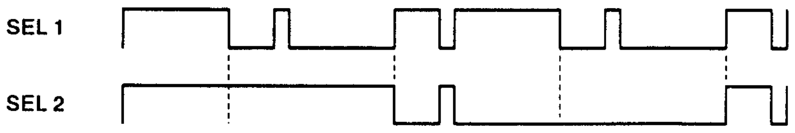
Timing chart 1
FF, REW, REC


2V
RF SWP
1/2 RF SWP
SEL 1
SEL 2

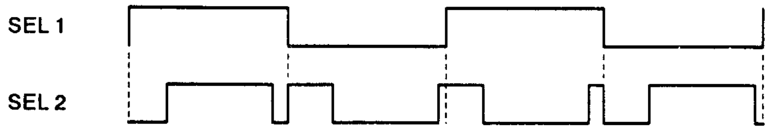
Timing chart 2
FR-SEARCH(CUE/REV)
PICTURE-SEARCH(CUE/REV)



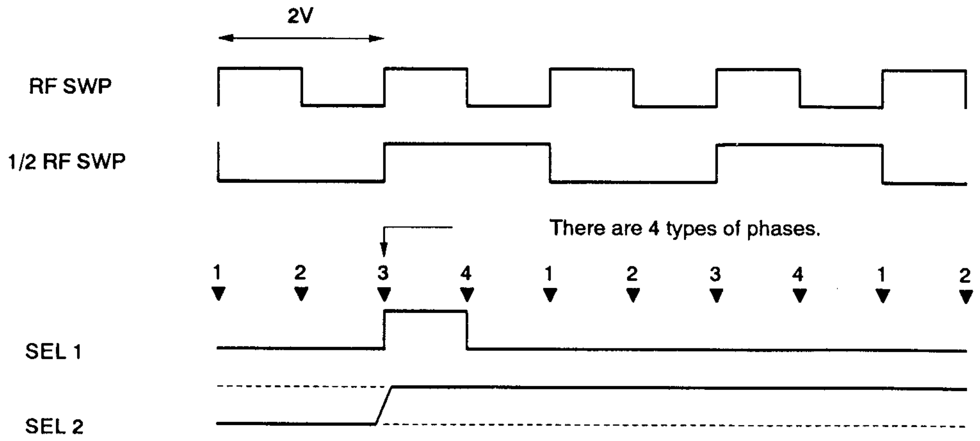
Timing chart 3
PB, EDIT-SEARCH(FWD)
REC-REVIEW(FWD)



Timing chart 4
EDIT-SEARCH(RVS)
REC-REVIEW(RVS)

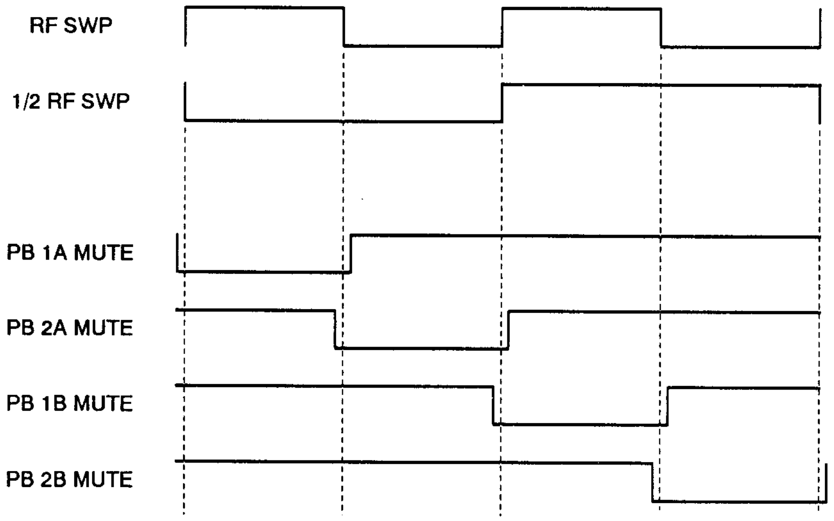


Timing chart 5
FRAME, SLOW

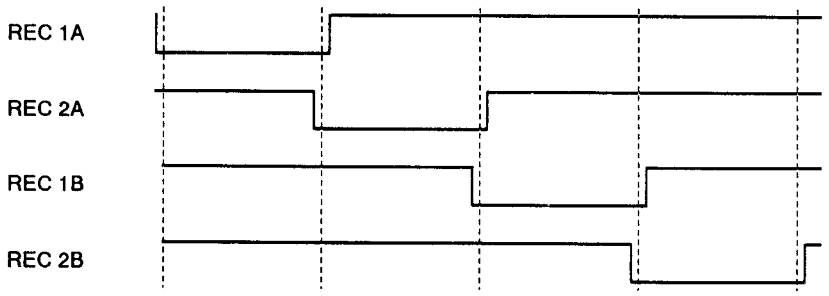

2V
RF SWP
1/2 RF SWP
There are 4 types of phases.
1
2
3
4
1
2
3
4
1
2
SEL 1
SEL 2

- 1 pulse generates every frame advancing is pressed in FRAME.
- 1 pulse generates 1 time in 10V in SLOW.

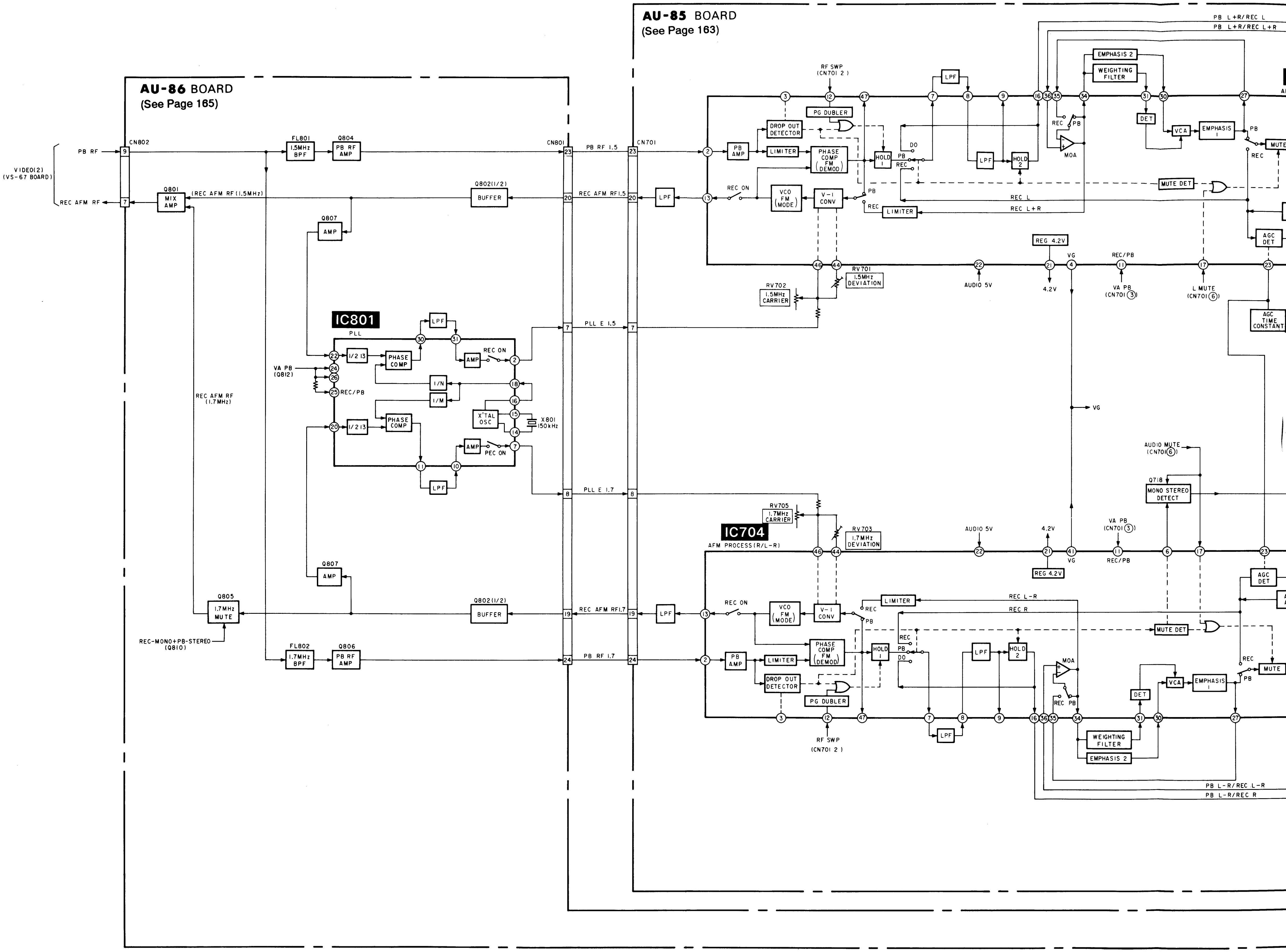
Timing chart 6

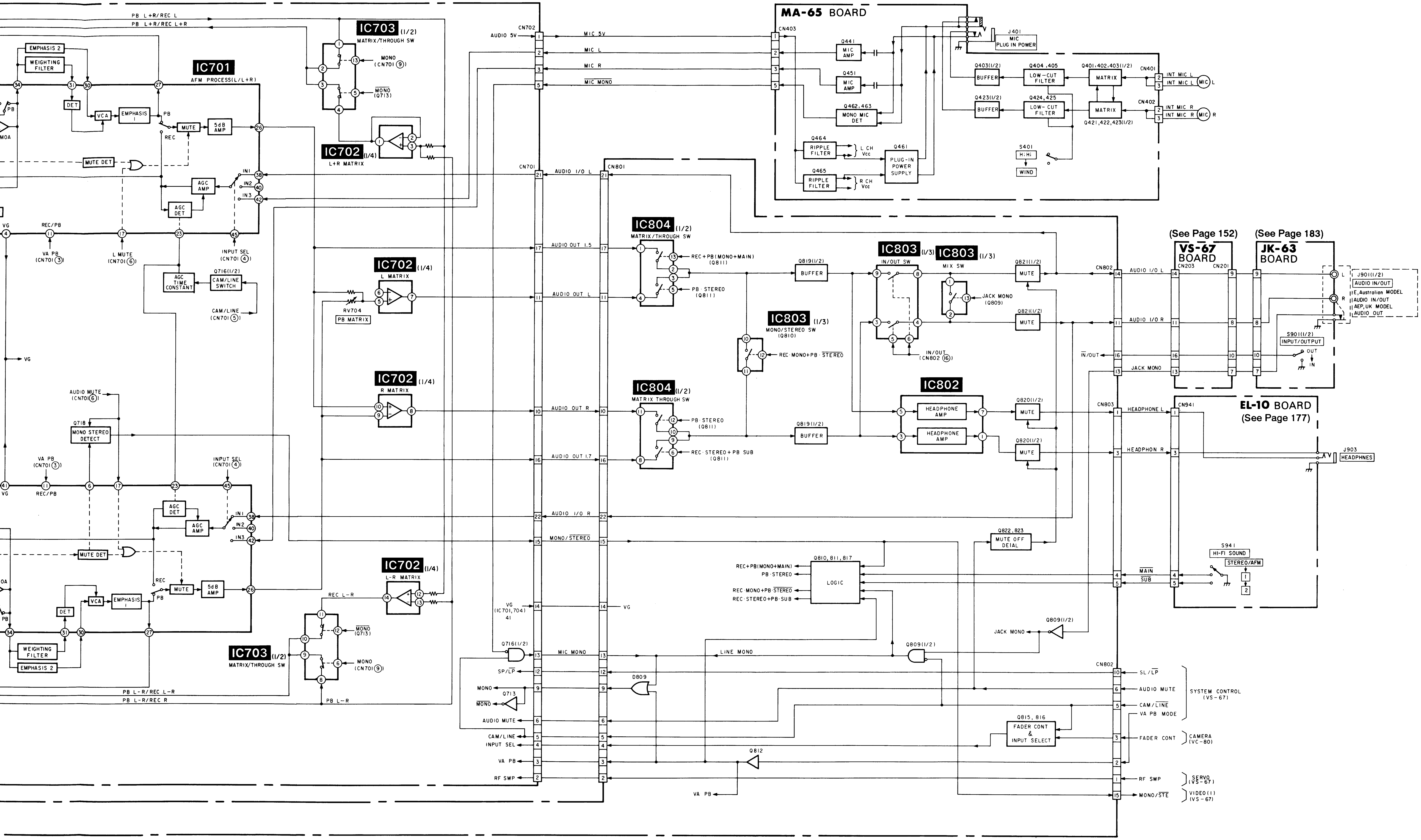

RF SWP
1/2 RF SWP
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE

Timing chart 7

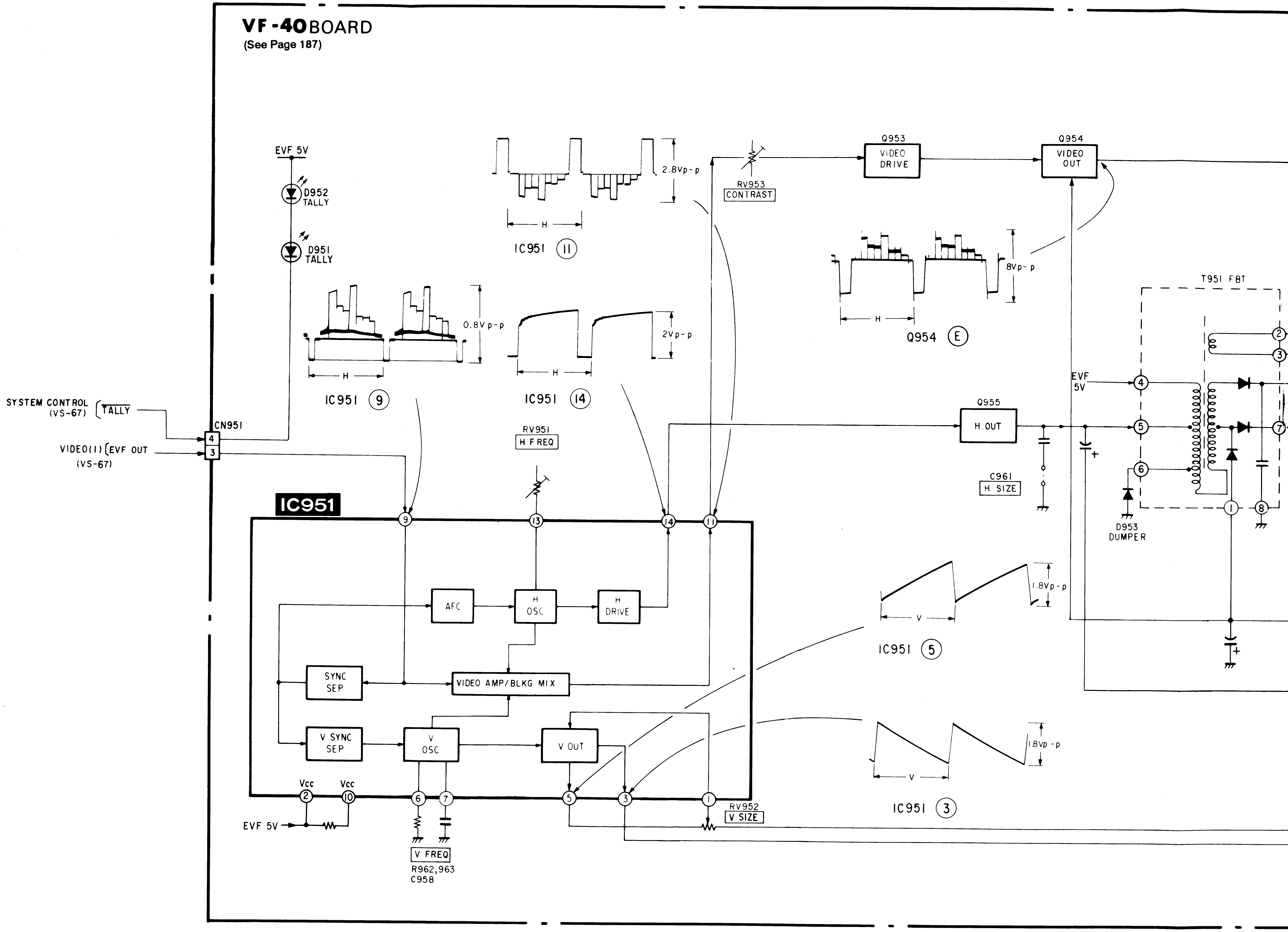

REC 1A
REC 2A
REC 1B
REC 2B

3-13. AUDIO BLOCK DIAGRAM

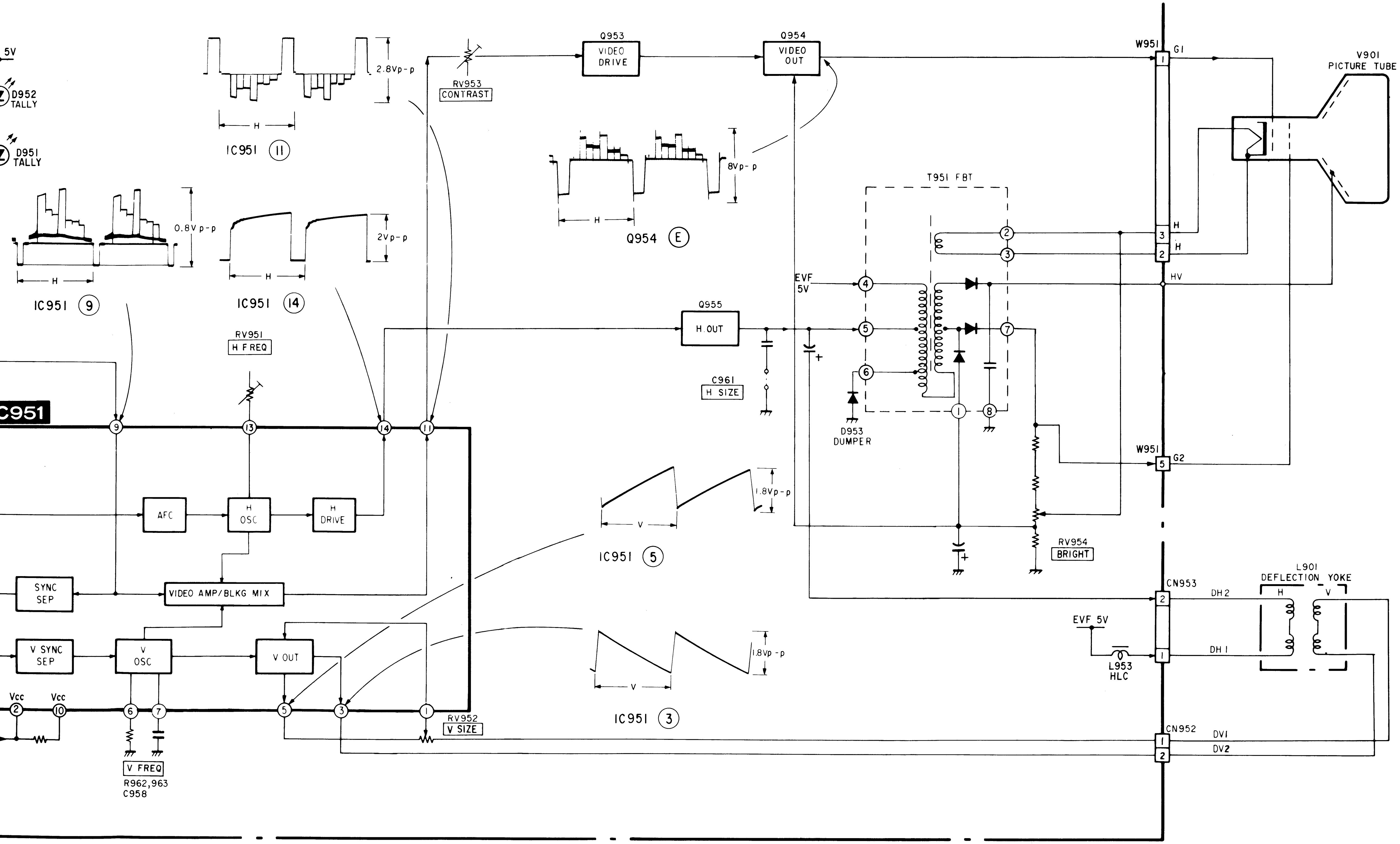

AU-86 BOARD
(See Page 165)
AU-85 BOARD
(See Page 163)
VIDEO(2)
(VS-67 BOARD)
PB RF
REC AFM RF
CN802
CN801
CN701
FL801
1.5MHz BPF
Q804
PB RF AMP
Q801
MIX AMP
(REC AFM RF(1.5MHz)
Q802(1/2)
BUFFER
Q807
AMP
IC801
PLL
LPF
1/2 13
PHASE COMP
AMP
REC ON
1/N
1/M
X'TAL OSC
X801
150kHz
VA PB
(Q812)
REC/PB
REC AFM RF
(1.7MHz)
Q805
1.7MHz
MUTE
REC-MONO+PB-STEREO
(Q810)
FL802
1.7MHz BPF
Q806
PB RF AMP
PB RF 1.5
REC AFM RF1.5
PLL E 1.5
PLL E 1.7
REC AFM RF1.7
PB RF 1.7
PB AMP
LIMITER
DROP OUT DETECTOR
PG DUBLER
RF SWP
(CN701 2)
PHASE COMP
(FM DEMOD)
HOLD 1
HOLD 2
VCO
(FM MODE)
V-I CONV
DO
MOA
EMPHASIS 2
WEIGHTING FILTER
DET
VCA
EMPHASIS 1
MUTE
MUTE DET
REC L
REC L+R
REC L-R
REC R
PB L+R/REC L
PB L+R/REC L+R
PB L-R/REC L-R
PB L-R/REC R
RV701
1.5MHz DEVIATION
RV702
1.5MHz CARRIER
RV705
1.7MHz CARRIER
RV703
1.7MHz DEVIATION
IC704
AFM PROCESS(R/L-R)
REG 4.2V
AUDIO 5V
4.2V
VG
VA PB
(CN701 ③)
L MUTE
(CN701 ⑥)
AGC DET
AGC TIME CONSTANT
AUDIO MUTE
(CN701⑥)
Q718
MONO STEREO DETECT


IC701
AFM PROCESS(L/L+R)
IC702 (1/4)
L+R MATRIX
IC702 (1/4)
L MATRIX
IC702 (1/4)
R MATRIX
IC702 (1/4)
L-R MATRIX
IC703 (1/2)
MATRIX/THROUGH SW
IC804 (1/2)
MATRIX/THROUGH SW
IC803 (1/3)
IN/OUT SW
IC803 (1/3)
MIX SW
IC803 (1/3)
MONO/STEREO SW (Q810)
IC802
HEADPHONE AMP
PB L+R/REC L
PB L+R/REC L+R
PB L-R/REC L-R
PB L-R/REC R
EMPHASIS 2
WEIGHTING FILTER
DET
VCA
EMPHASIS 1
MUTE
5dB AMP
MUTE DET
AGC AMP
AGC DET
AGC TIME CONSTANT
Q716(1/2) CAM/LINE SWITCH
CAM/LINE (CN701⑤)
INPUT SEL (CN701④)
L MUTE (CN701⑥)
VA PB (CN701③)
REC/PB
VG
AUDIO MUTE (CN701⑥)
Q718 MONO STEREO DETECT
MONO (CN701⑨)
MONO (Q713)
REC L-R
PB L-R
RV704
PB MATRIX
CN701
CN702
CN801
AUDIO 5V
MIC 5V
MIC L
MIC R
MIC MONO
AUDIO I/O L
AUDIO OUT 1.5
AUDIO OUT L
AUDIO OUT R
AUDIO OUT 1.7
AUDIO I/O R
MONO/STEREO
VG (IC701,704) 41
Q716(1/2)
SP/LP
MONO
Q713
AUDIO MUTE
CAM/LINE
INPUT SEL
VA PB
RF SWP
REC+PB(MONO+MAIN) (Q811)
PB STEREO (Q811)
REC STEREO+PB SUB (Q811)
REC MONO+PB STEREO
Q819(1/2) BUFFER
Q821(1/2) MUTE
Q820(1/2) MUTE
JACK MONO (Q809)
IN/OUT (CN802 ⑯)
Q822, 823 MUTE OFF DEIAL
Q810, 811, 817 LOGIC
REC+PB(MONO+MAIN)
PB STEREO
REC MONO+PB STEREO
REC STEREO+PB SUB
Q809(1/2)
JACK MONO
LINE MONO
D809
Q812
Q815, 816 FADER CONT & INPUT SELECT
MA-65 BOARD
CN403
Q441 MIC AMP
Q451 MIC AMP
Q462,463 MONO MIC DET
Q464 RIPPLE FILTER
Q465 RIPPLE FILTER
L CH Vcc
R CH Vcc
Q461 PLUG-IN POWER SUPPLY
J401 MIC PLUG IN POWER
Q403(1/2) BUFFER
Q423(1/2) BUFFER
Q404,405 LOW-CUT FILTER
Q424,425 LOW-CUT FILTER
Q401,402,403(1/2) MATRIX
Q421,422,423(1/2) MATRIX
CN401
CN402
INT MIC L
INT MIC R
MIC L
MIC R
S401 HiFi WIND
(See Page 152)
VS-67 BOARD
CN203
CN201
(See Page 183)
JK-63 BOARD
CN802
AUDIO I/O L
AUDIO I/O R
IN/OUT
JACK MONO
J901(1/2) AUDIO IN/OUT
E,Australian MODEL AUDIO IN/OUT
AEP,UK MODEL AUDIO OUT
S901(1/2) INPUT/OUTPUT
OUT
IN
EL-10 BOARD
(See Page 177)
CN803
CN941
HEADPHONE L
HEADPHON R
J903 HEADPHNES
S941 HI-FI SOUND STEREO/AFM
MAIN
SUB
SL/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
SYSTEM CONTROL (VS-67)
FADER CONT
CAMERA (VC-80)
RF SWP
SERVO (VS-67)
MONO/STE
VIDEO(1) (VS-67)

3-14. VIEW FINDER BLOCK DIAGRAM

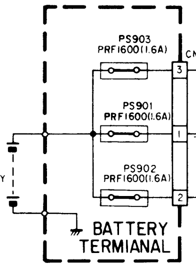

VF-40 BOARD
(See Page 187)
EVF 5V
D952
TALLY
D951
TALLY
SYSTEM CONTROL (VS-67)
TALLY
VIDEO(1) EVF OUT (VS-67)
CN951
4
3
0.8Vp-p
H
IC951 9
2.8Vp-p
H
IC951 11
2Vp-p
H
IC951 14
RV951
H FREQ
RV953
CONTRAST
Q953
VIDEO DRIVE
Q954
VIDEO OUT
8Vp-p
H
Q954 E
T951 FBT
EVF 5V
Q955
H OUT
C961
H SIZE
D953
DUMPER
IC951
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
Vcc
Vcc
EVF 5V
V FREQ
R962,963
C958
RV952
V SIZE
1.8Vp-p
V
IC951 5
1.8Vp-p
V
IC951 3

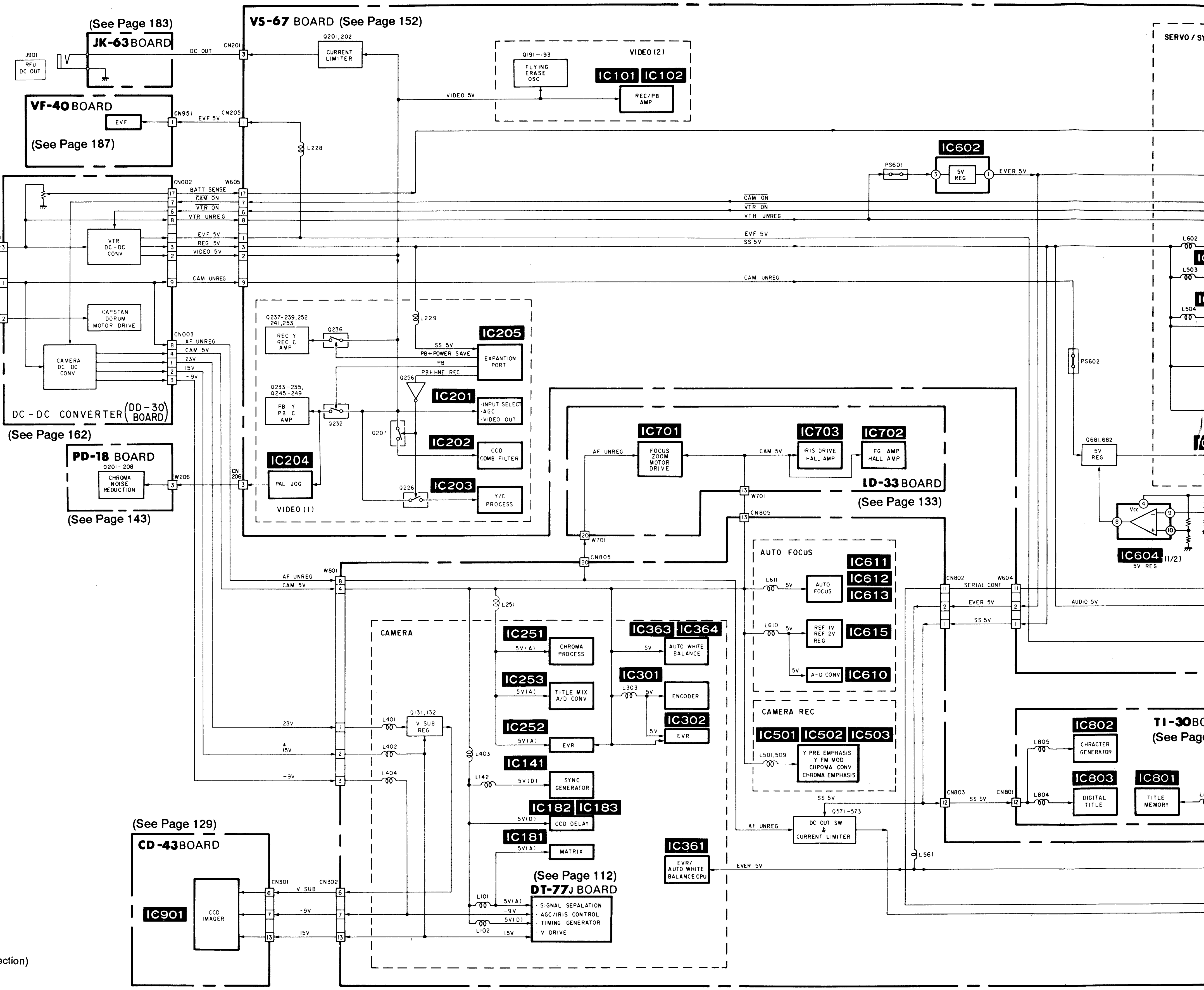
O BOARD
e 187)



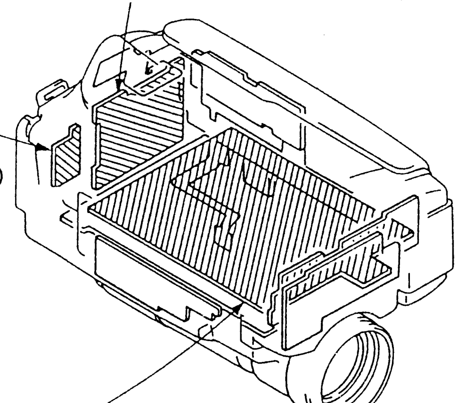
5V
D952 TALLY
D951 TALLY
2.8Vp-p
H
IC951 ⑪
Q953 VIDEO DRIVE
Q954 VIDEO OUT
RV953 CONTRAST
W951
G1
1
V901 PICTURE TUBE
8Vp-p
H
Q954 Ⓔ
0.8Vp-p
H
IC951 ⑨
2Vp-p
H
IC951 ⑭
T951 FBT
②
③
3 H
2 H
EVF 5V
④
HV
Q955 H OUT
⑤
⑦
RV951 H FREQ
⑥
C961 H SIZE
D953 DUMPER
①
⑧
C951
⑨
⑬
⑭
⑪
W951
5 G2
1.8Vp-p
V
AFC
H OSC
H DRIVE
IC951 ⑤
RV954 BRIGHT
SYNC SEP
VIDEO AMP/BLKG MIX
CN953
L901 DEFLECTION YOKE
H
V
2 DH2
EVF 5V
V SYNC SEP
V OSC
V OUT
1.8Vp-p
V
1 DH1
L953 HLC
IC951 ③
Vcc ②
Vcc ⑩
⑥
⑦
⑤
③
①
RV952 V SIZE
CN952
1 DV1
2 DV2
V FREQ
R962,963
C958

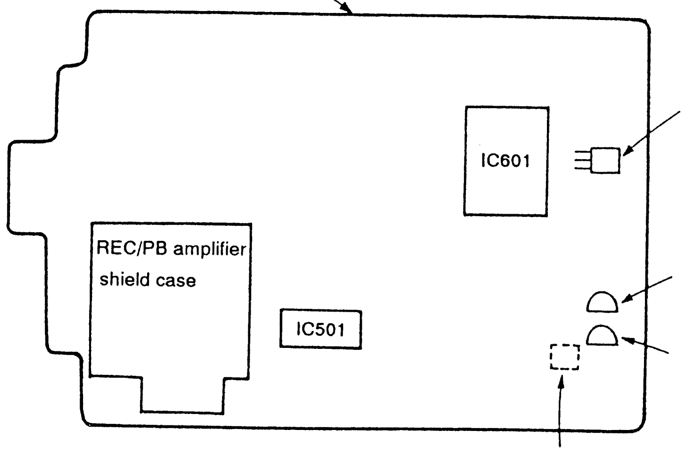
3-15. POWER BLOCK DIAGRAM

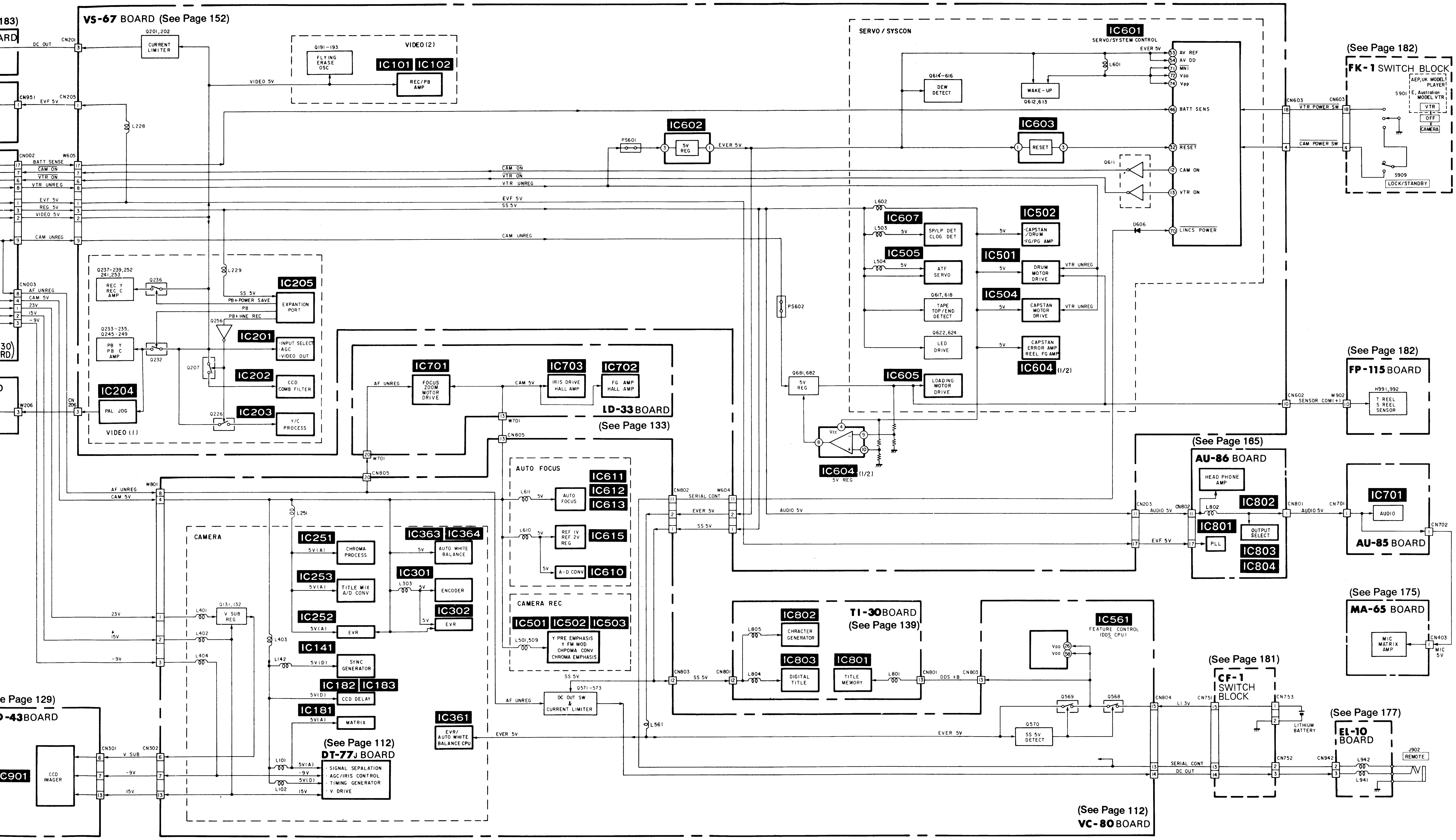

PS903
PRF1600(1.6A)
PS901
PRF1600(1.6A)
PS902
PRF1600(1.6A)
MAIN
BATTERY
BATTERY
TERMIANAL


(See Page 183)
JK-63 BOARD
J901
RFU
DC OUT
DC OUT
CN201
VF-40 BOARD
EVF
CN951
EVF 5V
CN205
(See Page 187)
CN901
VTR UNREG
CN001
CAM UNREG
MOTOR UNREG
CN002
W605
BATT SENSE
CAM ON
VTR ON
VTR UNREG
VTR
DC-DC
CONV
EVF 5V
REG 5V
VIDEO 5V
CAM UNREG
CAPSTAN
DORUM
MOTOR DRIVE
CN003
AF UNREG
CAM 5V
23V
15V
-9V
CAMERA
DC-DC
CONV
DC-DC CONVERTER (DD-30 BOARD)
(See Page 162)
PD-18 BOARD
Q201-208
CHROMA
NOISE
REDUCTION
W206
CN206
(See Page 143)
VS-67 BOARD (See Page 152)
Q201,202
CURRENT
LIMITER
L228
VIDEO 5V
Q191-193
FLYING
ERASE
OSC
VIDEO (2)
IC101
IC102
REC/PB
AMP
Q237-239,252
241,253
REC Y
REC C
AMP
Q236
Q233-235,
Q245-249
PB Y
PB C
AMP
Q232
Q256
Q207
Q226
L229
SS 5V
PB+POWER SAVE
PB
PB+HNE REC
IC205
EXPANTION
PORT
IC201
·INPUT SELECT
·AGC
·VIDEO OUT
IC202
CCD
COMB FILTER
IC204
PAL JOG
IC203
Y/C
PROCESS
VIDEO (1)
IC602
PS601
5V
REG
EVER 5V
CAM ON
VTR ON
VTR UNREG
EVF 5V
SS 5V
CAM UNREG
PS602
Q681,682
5V
REG
Vcc
IC604 (1/2)
5V REG
SERVO / SY
L602
L503
L504
AF UNREG
IC701
FOCUS
ZOOM
MOTOR
DRIVE
CAM 5V
IC703
IRIS DRIVE
HALL AMP
IC702
FG AMP
HALL AMP
LD-33 BOARD
(See Page 133)
W701
CN805
W701
CN805
W801
AF UNREG
CAM 5V
AUTO FOCUS
L611
5V
AUTO
FOCUS
IC611
IC612
IC613
L610
REF 1V
REF 2V
REG
IC615
5V
A-D CONV
IC610
CN802
W604
SERIAL CONT
EVER 5V
SS 5V
AUDIO 5V
CAMERA
L251
IC251
5V(A)
CHROMA
PROCESS
IC363
IC364
5V
AUTO WHITE
BALANCE
IC253
5V(A)
TITLE MIX
A/D CONV
IC301
L303
5V
ENCODER
IC302
5V
EVR
IC252
5V(A)
EVR
IC141
5V(D)
SYNC
GENERATOR
IC182
IC183
5V(D)
CCD DELAY
IC181
5V(A)
MATRIX
L401
Q131,132
V SUB
REG
L402
L404
L403
L142
23V
15V
-9V
CAMERA REC
IC501
IC502
IC503
L501,509
Y PRE EMPHASIS
Y FM MOD
CHPOMA CONV
CHROMA EMPHASIS
SS 5V
Q571-573
AF UNREG
DC OUT SW
&
CURRENT LIMITER
IC361
EVR/
AUTO WHITE
BALANCE CPU
EVER 5V
L561
CN803
SS 5V
CN801
TI-30 BO
(See Pag
L805
IC802
CHRACTER
GENERATOR
L804
IC803
DIGITAL
TITLE
IC801
TITLE
MEMORY
(See Page 129)
CD-43 BOARD
IC901
CCD
IMAGER
CN301
CN302
V SUB
-9V
15V
L101
L102
5V(A)
-9V
5V(D)
15V
(See Page 112)
DT-77J BOARD
· SIGNAL SEPALATION
· AGC/IRIS CONTROL
· TIMING GENERATOR
· V DRIVE

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]


DD-30 board
(DC-DC converter,
drum/capstan error power amplification)
Battery terminal
IC LINK are housed.
PS901 (CAM UNREG protection)
PS902 (MOTOR UNREG protection)
PS903 (VTR UNREG protection)
VS-67 board

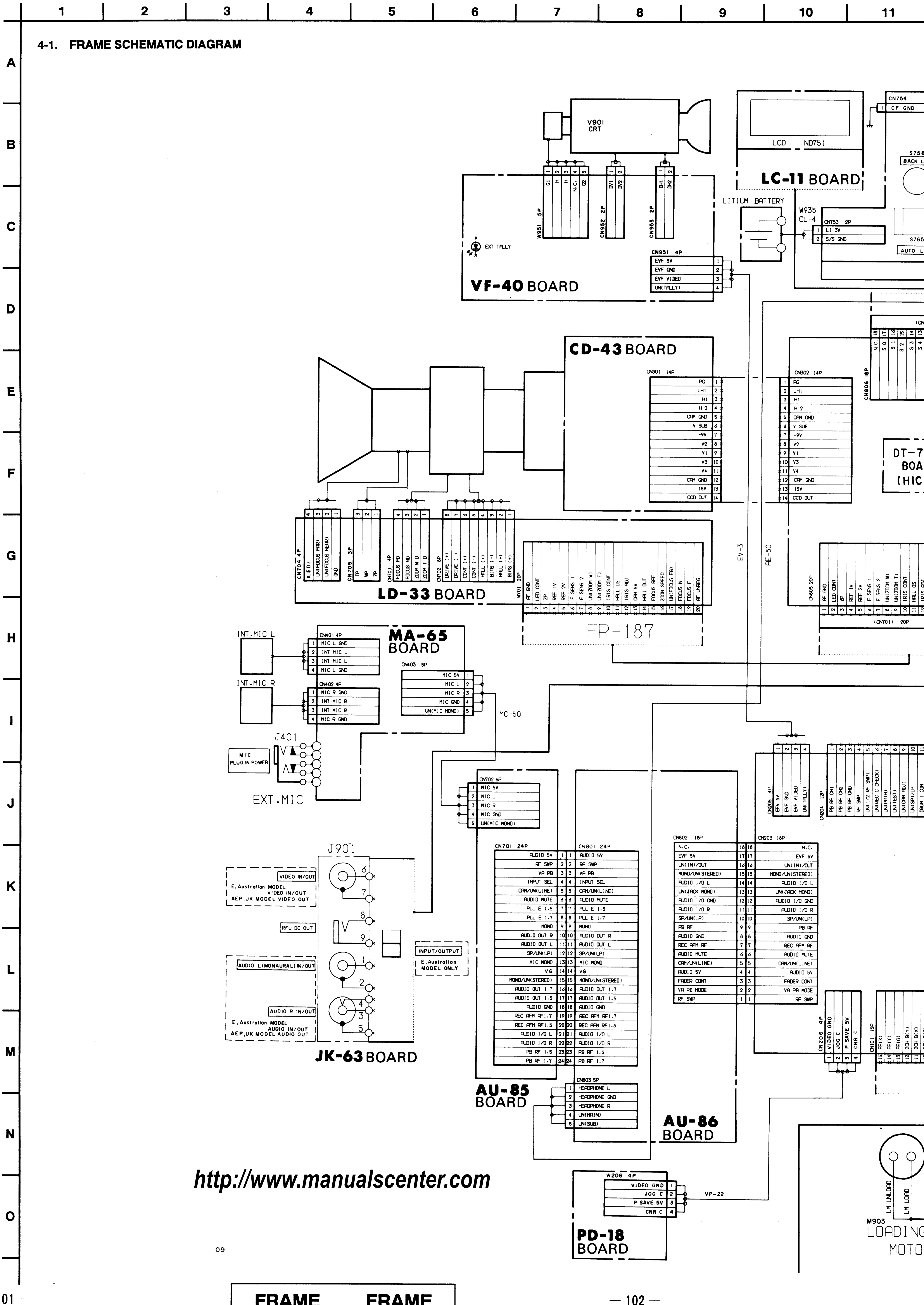

IC601
REC/PB amplifier
shield case
IC501
IC602
(EVER 5V regulator)
PS601
(EVER 5V protection)
PS602
(Loading motor power protection)
Q682
(Loading motor power regulator)

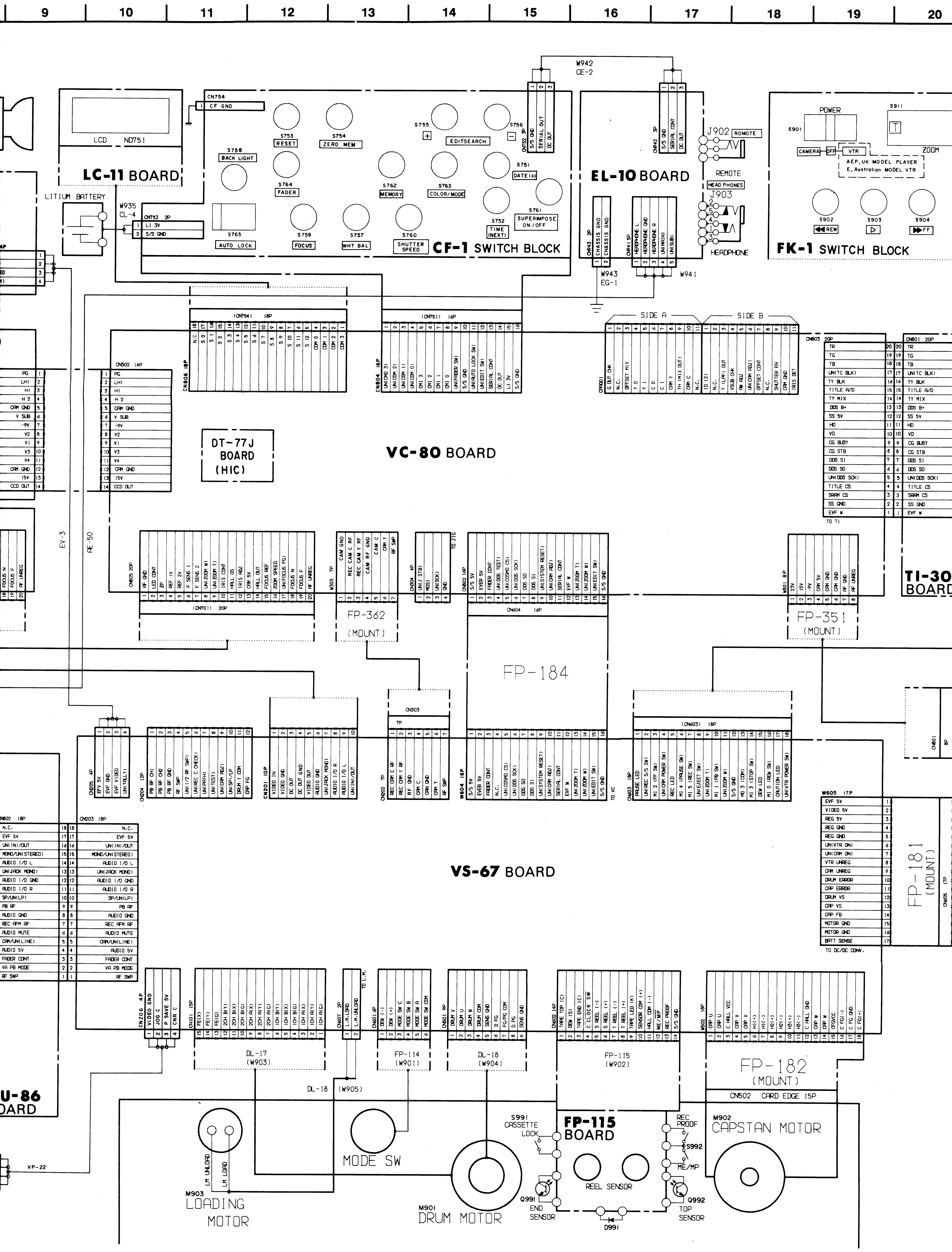

VS-67 BOARD (See Page 152)
CURRENT LIMITER
Q201,202
VIDEO (2)
FLYING ERASE OSC
IC101 IC102
REC/PB AMP
VIDEO 5V
DC OUT
EVF 5V
BATT SENSE
CAM ON
VTR ON
VTR UNREG
REG 5V
VIDEO 5V
CAM UNREG
AF UNREG
CAM 5V
23V
15V
-9V
REC Y REC C AMP
PB Y PB C AMP
IC205
EXPANTION PORT
IC201
INPUT SELECT AGC VIDEO OUT
IC202
CCD COMB FILTER
IC203
Y/C PROCESS
IC204
PAL JOG
VIDEO (1)
SERVO / SYSCON
IC601
SERVO/SYSTEM CONTROL
AV REF
AV DD
MNI
VDD
VPP
BATT SENS
RESET
CAM ON
VTR ON
LINCS POWER
DEW DETECT
WAKE-UP
IC602
5V REG
EVER 5V
IC603
RESET
IC607
SP/LP DET CLOG DET
IC505
ATF SERVO
TAPE TOP/END DETECT
LED DRIVE
IC605
LOADING MOTOR DRIVE
IC502
CAPSTAN /DRUM FG/PG AMP
IC501
DRUM MOTOR DRIVE
IC504
CAPSTAN MOTOR DRIVE
CAPSTAN ERROR AMP REEL FG AMP
IC604 (1/2)
5V REG
SS 5V
EVF 5V
(See Page 182)
FK-1 SWITCH BLOCK
AEP,UK MODEL PLAYER
E, Australian MODEL VTR
VTR
OFF
CAMERA
LOCK/STANDBY
VTR POWER SW
CAM POWER SW
(See Page 182)
FP-115 BOARD
T REEL S REEL SENSOR
SENSOR COM(+)
IC701
FOCUS ZOOM MOTOR DRIVE
IC703
IRIS DRIVE HALL AMP
IC702
FG AMP HALL AMP
LD-33 BOARD
(See Page 133)
AUTO FOCUS
IC611
IC612
IC613
AUTO FOCUS
REF 1V REF 2V REG
IC615
A-D CONV
IC610
CAMERA REC
IC501 IC502 IC503
Y PRE EMPHASIS Y FM MOD CHROMA CONV CHROMA EMPHASIS
CAMERA
IC251
CHROMA PROCESS
IC363 IC364
AUTO WHITE BALANCE
IC253
TITLE MIX A/D CONV
IC301
ENCODER
IC252
EVR
IC302
EVR
IC141
SYNC GENERATOR
IC182 IC183
CCD DELAY
IC181
MATRIX
IC361
EVR/ AUTO WHITE BALANCE CPU
V SUB REG
(See Page 112)
DT-77J BOARD
SIGNAL SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
CCD IMAGER
IC901
(See Page 129)
-43BOARD
DC OUT SW & CURRENT LIMITER
SERIAL CONT
AUDIO 5V
T1-30BOARD
(See Page 139)
IC802
CHRACTER GENERATOR
IC803
DIGITAL TITLE
IC801
TITLE MEMORY
DDS +B
IC561
FEATURE CONTROL (DDS CPU)
SS 5V DETECT
(See Page 112)
VC-80 BOARD
(See Page 165)
AU-86 BOARD
HEAD PHONE AMP
IC802
IC801
OUTPUT SELECT
PLL
IC803
IC804
IC701
AUDIO
AU-85 BOARD
(See Page 175)
MA-65 BOARD
MIC MATRIX AMP
MIC 5V
(See Page 181)
CF-1 SWITCH BLOCK
LITHIUM BATTERY
(See Page 177)
EL-10 BOARD
REMOTE
SERIAL CONT
DC OUT
LI 3V

SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

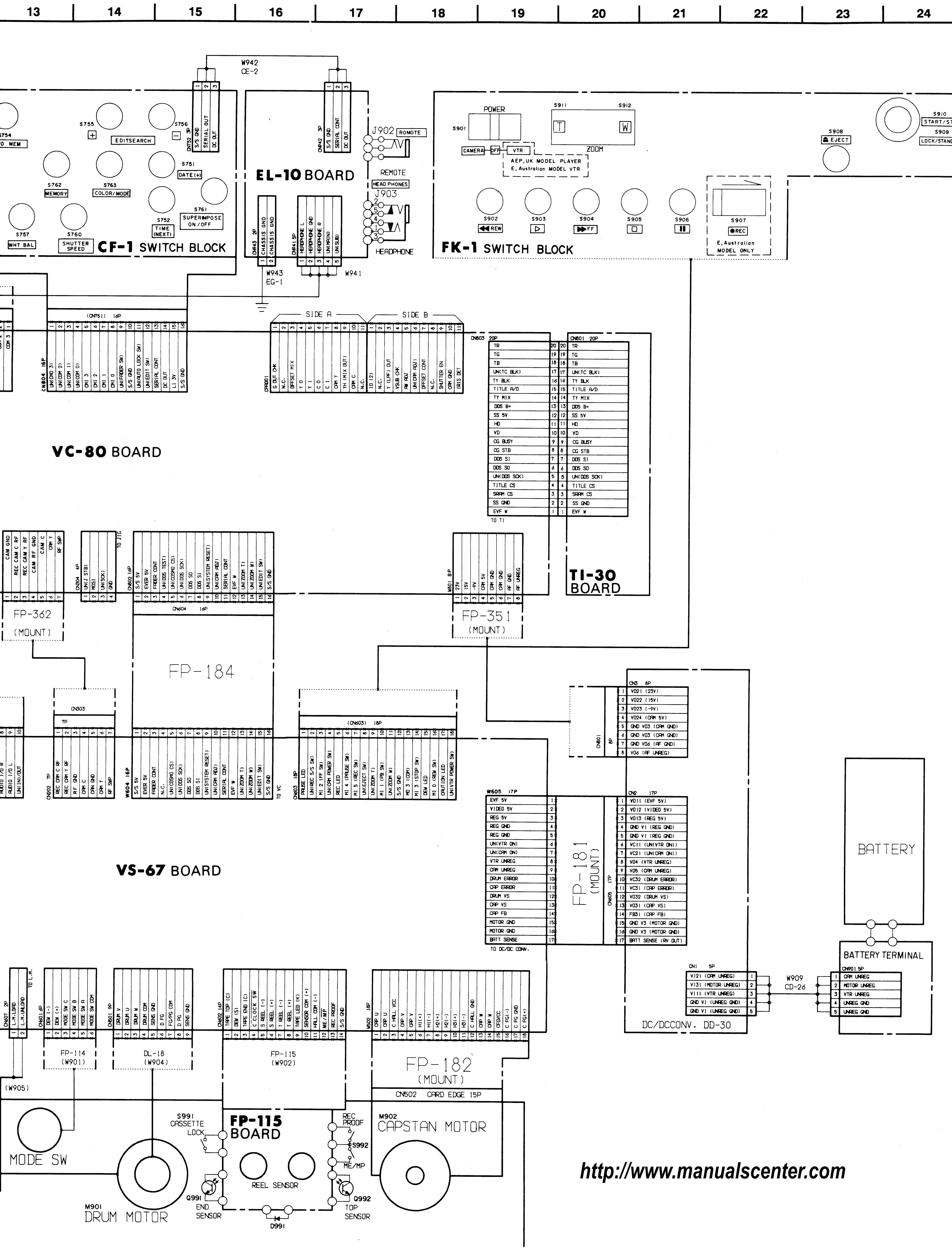
4-1. FRAME SCHEMATIC DIAGRAM

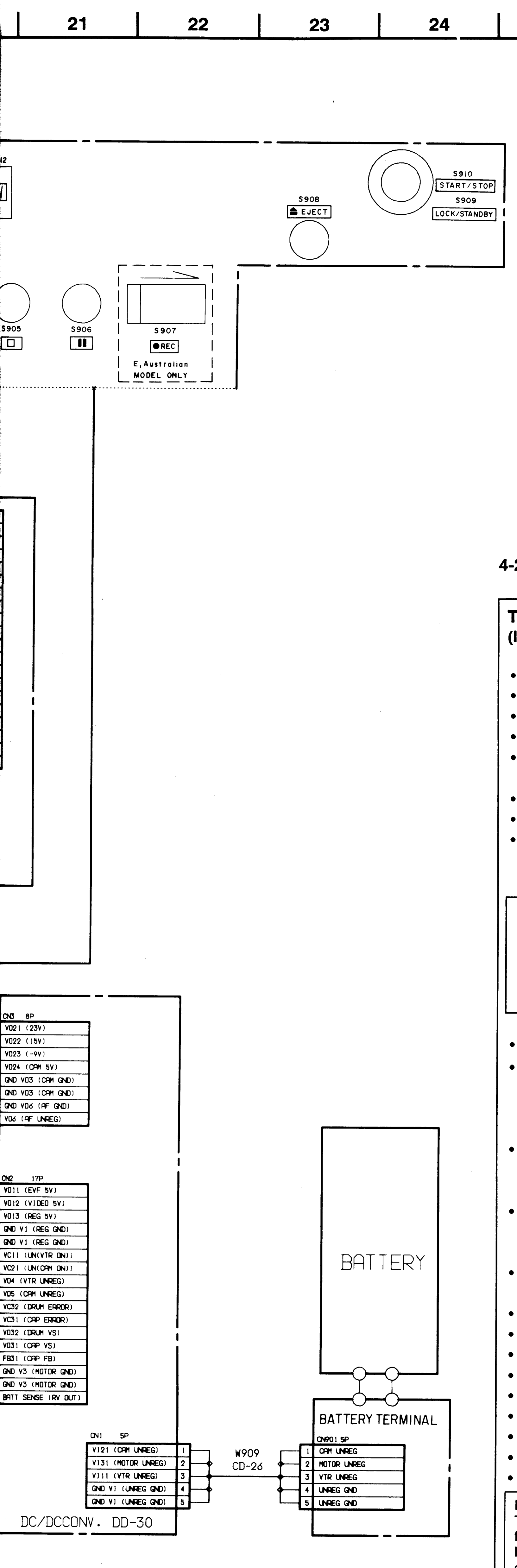

V901 CRT
LCD ND751
LC-11 BOARD
CN754
CF GND
S758
BACK L
LITIUM BATTERY
W935 CL-4
CN753 2P
LI 3V
S/S GND
S765
AUTO L
EXT TALLY
W951 5P
CN952 2P
CN953 2P
CN951 4P
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
VF-40 BOARD
CD-43 BOARD
CN301 14P
CN302 14P
CN806 18P
DT-7 BOA (HIC
CN704 4P
CN705 3P
CN703 4P
CN702 8P
LD-33 BOARD
W701 20P
FP-187
CN805 20P
(CN701) 20P
EV-3
AE-50
INT.MIC L
INT.MIC R
MA-65 BOARD
CN401 4P
CN402 4P
CN403 5P
MC-50
J401
MIC PLUG IN POWER
EXT.MIC
CN702 5P
J901
VIDEO IN/OUT
E, Australian MODEL VIDEO IN/OUT
AEP, UK MODEL VIDEO OUT
RFU DC OUT
AUDIO L(MONAURAL)IN/OUT
AUDIO R IN/OUT
E, Australian MODEL AUDIO IN/OUT
AEP, UK MODEL AUDIO OUT
INPUT/OUTPUT
E, Australian MODEL ONLY
JK-63 BOARD
CN701 24P
CN801 24P
CN802 18P
CN203 18P
CN205 4P
CN204 12P
CN206 4P
CN101 15P
AU-85 BOARD
CN803 5P
AU-86 BOARD
W206 4P
VIDEO GND
JOG C
P SAVE 5V
CNR C
VP-22
PD-18 BOARD
M903 LOADING MOTO
LM UNLOAD
LM LOAD
09


9
10
11
12
13
14
15
16
17
18
19
20
LCD ND751
LC-11 BOARD
LITIUM BATTERY
W935 CL-4
CN754
CF GND
CN753 2P
LI 3V
S/S GND
S753 RESET
S754 ZERO MEM
S755
EDITSEARCH
S756
S758 BACK LIGHT
S764 FADER
S762 MEMORY
S763 COLOR/MODE
S751 DATE(+)
S761 SUPERIMPOSE ON/OFF
S752 TIME (NEXT)
S765 AUTO LOCK
S759 FOCUS
S757 WHT BAL
S760 SHUTTER SPEED
CF-1 SWITCH BLOCK
CN752 3P
S/S GND
SERIAL OUT
DC OUT
W942 CE-2
EL-10 BOARD
CN942 3P
J902 REMOTE
J903 HEAD PHONES
HEADPHONE
CN943 2P
CHASSIS GND
CN941 5P
HEADPHONE L
HEADPHONE GND
HEADPHONE R
UN(MAIN)
UN(SUB)
W943 EG-1
W941
POWER
S911
S901
CAMERA
OFF
VTR
ZOOM
AEP,UK MODEL PLAYER
E,Australian MODEL VTR
S902 REW
S903
S904 FF
FK-1 SWITCH BLOCK
SIDE A
SIDE B
(CN754) 18P
CN806 18P
(CN751) 16P
CN804 16P
CN502 14P
DT-77J BOARD (HIC)
VC-80 BOARD
CN803 20P
CN801 20P
TO TI
TI-30 BOARD
EV-3
AE-50
CN805 20P
(CN701) 20P
W303 7P
FP-362 (MOUNT)
CN304 4P
TO JIG
CN802 16P
CN604 16P
FP-184
W801 8P
FP-351 (MOUNT)
CN303
(CN603) 18P
CN205 4P
CN204 12P
CN201 10P
CN202 7P
W604 16P
TO VC
CN603 18P
W605 17P
FP-181 (MOUNT)
TO DC/DC CONV.
VS-67 BOARD
CN802 18P
CN203 18P
CN206 4P
CN101 15P
CN607 2P
TO L.M.
CN601 6P
CN501 9P
CN602 14P
W502 18P
DL-17 (W903)
FP-114 (W901)
DL-18 (W904)
FP-115 (W902)
FP-182 (MOUNT)
CN502 CARD EDGE 15P
DL-18 (W905)
U-86 BOARD
VP-22
LM UNLOAD
LM LOAD
M903 LOADING MOTOR
MODE SW
M901 DRUM MOTOR
S991 CASSETTE LOCK
FP-115 BOARD
REEL SENSOR
Q991 END SENSOR
D991
REC PROOF
S992
ME/MP
Q992 TOP SENSOR
M902 CAPSTAN MOTOR

http://www.manualscenter.com

FRAME FRAME


13 14 15 16 17 18 19 20 21 22 23 24
W942
CE-2
CF-1 SWITCH BLOCK
S754
S755
S756
S757
S760
S761
S762
S763
S751
S752
EDITSEARCH
DATE (+)
MEMORY
COLOR/MODE
SUPERIMPOSE ON/OFF
TIME (NEXT)
WHT BAL
SHUTTER SPEED
CN752 3P
S/S GND
SERIAL OUT
DC OUT
EL-10 BOARD
CN942 3P
S/S GND
SERIAL CONT
DC OUT
J902
ROMOTE
REMOTE
HEAD PHONES
J903
HEADPHONE
CN943 2P
CHASSIS GND
CHASSIS GND
CN941 5P
HEADPHONE L
HEADPHONE GND
HEADPHONE R
UN(MAIN)
UN(SUB)
W943
EG-1
W941
FK-1 SWITCH BLOCK
POWER
S901
CAMERA
OFF
VTR
AEP, UK MODEL PLAYER
E, Australian MODEL VTR
S911
S912
ZOOM
T
W
S902 REW
S903
S904 FF
S905
S906
S907 REC
E, Australian MODEL ONLY
S908 EJECT
S910 START/ST
S909 LOCK/STAND
(CN751) 16P
CN804 16P
UN(CMD 3)
UN(CDM 2)
UN(CDM 1)
UN(CDM 0)
CHI 3
CHI 2
CHI 1
CHI 0
UN(FADER SW)
S/S GND
UN(AUTO LOCK SW)
UN(EDIT SW)
SERIAL CONT
DC OUT
LI 3V
S/S GND
SIDE A
SIDE B
CPR001
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CAM Y
YH (MIX OUT)
CAM C
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
UN(CAM ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CAM GND
IRIS DET
CN803 20P
CN801 20P
TR
TG
TB
UN(TC BLK)
TY BLK
TITLE A/D
TY MIX
DDS B+
SS 5V
HD
VD
CG BUSY
CG STB
DDS SI
DDS SO
UN(DDS SCK)
TITLE CS
SRAM CS
SS GND
EVF W
TO TI
VC-80 BOARD
TI-30 BOARD
CAM GND
REC CAM C RF
REC CAM Y RF
CAM RF GND
CAM C
CAM Y
RF SWP
CN304 4P
UN(J STB)
MOSI
UN(SCK)
GND
TO JIG
CN602 16P
S/S 5V
EVER 5V
FADER CONT
UN(DDS TEST)
UN(COSMO CS)
UN(DDS SCK)
DDS SO
DDS SI
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
S/S GND
CN604 16P
W501 8P
23V
15V
-9V
CAM 5V
CAM GND
AF GND
AF UNREG
FP-362 (MOUNT)
FP-351 (MOUNT)
FP-184
CN303
7P
CN202 7P
REC CAM C RF
REC CAM Y RF
RF GND
CAM C
CAM GND
CAM Y
RF SWP
AUDIO I/O R
AUDIO I/O L
UN(IN/OUT)
W604 16P
N.C.
UN(COSMO CS)
TO VC
(CN603) 18P
CN603 18P
PAUSE LED
UN(REC SW)
MI 2 (FF SW)
UN(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
MI 5 (REC SW)
UN(EJECT SW)
UN(ZOOM T)
MI 1 (PB SW)
UN(ZOOM W)
MO 3 (COM)
S/S GND
MI 3 (STOP SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
UN(VTR POWER SW)
CN3 8P
V021 (23V)
V022 (15V)
V023 (-9V)
V024 (CAM 5V)
GND V03 (CAM GND)
GND V03 (CAM GND)
GND V06 (AF GND)
V06 (AF UNREG)
CN801 8P
VS-67 BOARD
W605 17P
EVF 5V
VIDEO 5V
REG 5V
REG GND
REG GND
UN(VTR ON)
UN(CAM ON)
VTR UNREG
CAM UNREG
DRUM ERROR
CAP ERROR
DRUM VS
CAP VS
CAP FB
MOTOR GND
MOTOR GND
BATT SENSE
TO DC/DC CONV.
FP-181 (MOUNT)
CN605 17P
CN2 17P
V011 (EVF 5V)
V012 (VIDEO 5V)
V013 (REG 5V)
GND V1 (REG GND)
GND V1 (REG GND)
VC11 (UN(VTR ON))
VC21 (UN(CAM ON))
V04 (VTR UNREG)
V05 (CAM UNREG)
VC32 (DRUM ERROR)
VC31 (CAP ERROR)
V032 (DRUM VS)
V031 (CAP VS)
FB31 (CAP FB)
GND V3 (MOTOR GND)
GND V3 (MOTOR GND)
BATT SENSE (RV OUT)
BATTERY
BATTERY TERMINAL
CN1 5P
V121 (CAM UNREG)
V131 (MOTOR UNREG)
V111 (VTR UNREG)
GND V1 (UNREG GND)
GND V1 (UNREG GND)
W909
CD-26
CN901 5P
CAM UNREG
MOTOR UNREG
VTR UNREG
UNREG GND
UNREG GND
DC/DCCONV. DD-30
CN607 2P
L.M.LOAD
L.M.UNLOAD
TO L.M.
CN601 6P
DEW (+)
DEW (-)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
CN501 9P
DRUM V
DRUM U
DRUM W
SENS GND
D FG
FG/PG COM
D PG
SENS GND
CN602 14P
TAPE TOP (C)
DEW (S)
TAPE END (C)
C CLOCK SW
S REEL (-)
S REEL (+)
T REEL (+)
T REEL (-)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/MP
REC PROOF
S/S GND
W502 18P
CAP U
CAP U
C HALL VCC
CAP V
CAP V
H1(+)
H1(-)
H2(+)
H2(-)
H3(-)
H3(+)
C HALL GND
CAP W
CAP W
CFG/CC
C FG(-)
C FG GND
C FG(+)
FP-114 (W901)
DL-18 (W904)
FP-115 (W902)
FP-182 (MOUNT)
CN502 CARD EDGE 15P
(W905)
MODE SW
M901 DRUM MOTOR
S991 CASSETTE LOCK
FP-115 BOARD
REEL SENSOR
Q991 END SENSOR
D991
REC PROOF
S992
ME/MP
Q992 TOP SENSOR
M902 CAPSTAN MOTOR
FRAME
FRAME


21
22
23
24
25
26
S910
START/STOP
S909
LOCK/STANDBY
S908
EJECT
S905
S906
S907
●REC
E,Australian
MODEL ONLY
CN3 8P
V021 (23V)
V022 (15V)
V023 (-9V)
V024 (CAM 5V)
GND V03 (CAM GND)
GND V03 (CAM GND)
GND V06 (AF GND)
V06 (AF UNREG)
CN2 17P
V011 (EVF 5V)
V012 (VIDEO 5V)
V013 (REG 5V)
GND V1 (REG GND)
GND V1 (REG GND)
VC11 (UN(VTR ON))
VC21 (UN(CAM ON))
V04 (VTR UNREG)
V05 (CAM UNREG)
VC32 (DRUM ERROR)
VC31 (CAP ERROR)
V032 (DRUM VS)
V031 (CAP VS)
FB31 (CAP FB)
GND V3 (MOTOR GND)
GND V3 (MOTOR GND)
BATT SENSE (RV OUT)
CN1 5P
V121 (CAM UNREG) 1
V131 (MOTOR UNREG) 2
V111 (VTR UNREG) 3
GND V1 (UNREG GND) 4
GND V1 (UNREG GND) 5
DC/DCCONV. DD-30
W909
CD-26
BATTERY
BATTERY TERMINAL
CN901 5P
1 CAM UNREG
2 MOTOR UNREG
3 VTR UNREG
4 UNREG GND
5 UNREG GND

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- —— : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ▒ : Pattern from the side which enables seeing. } The inner two layers' patterns are not indicated.
- ▓ : Pattern of the rear side.*
- Circled numbers refer to waveforms.*
- (B) or (F), etc. of capacitors indicate the temperature characteristics.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭∿ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.*
- —— : B+ Line.*
- - - - : B– Line*.
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

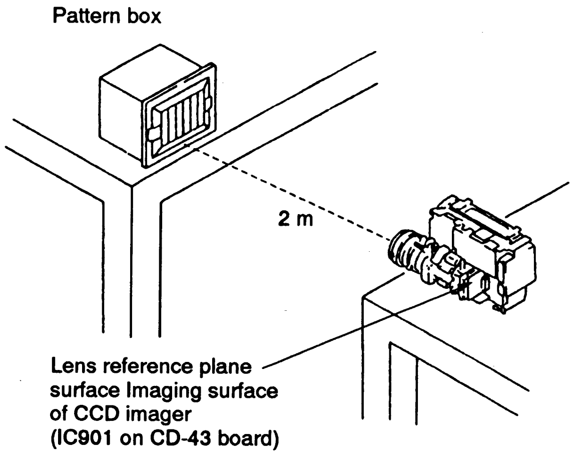
When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points. Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
2 m
Lens reference plane
surface Imaging surface
of CCD imager
(IC901 on CD-43 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

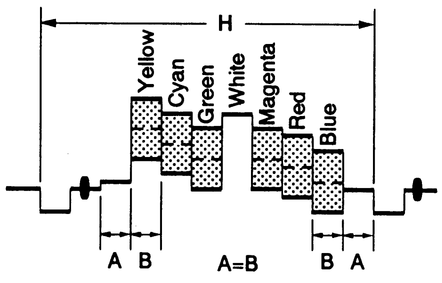

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)

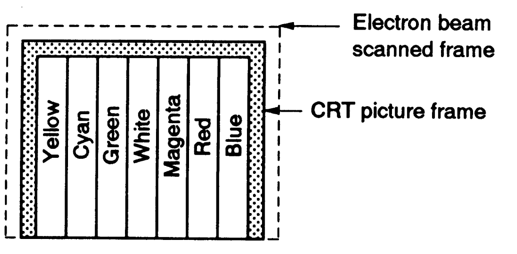

Electron beam
scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. b (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, MODE CONTROL, AUDIO, VIEW FINDER block)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

- *: indicated by the color red.

VC-80 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-80 BOARD: 2000 series —

- **For printed wiring boards.**
- VC-80 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VC-80 BOARD
****

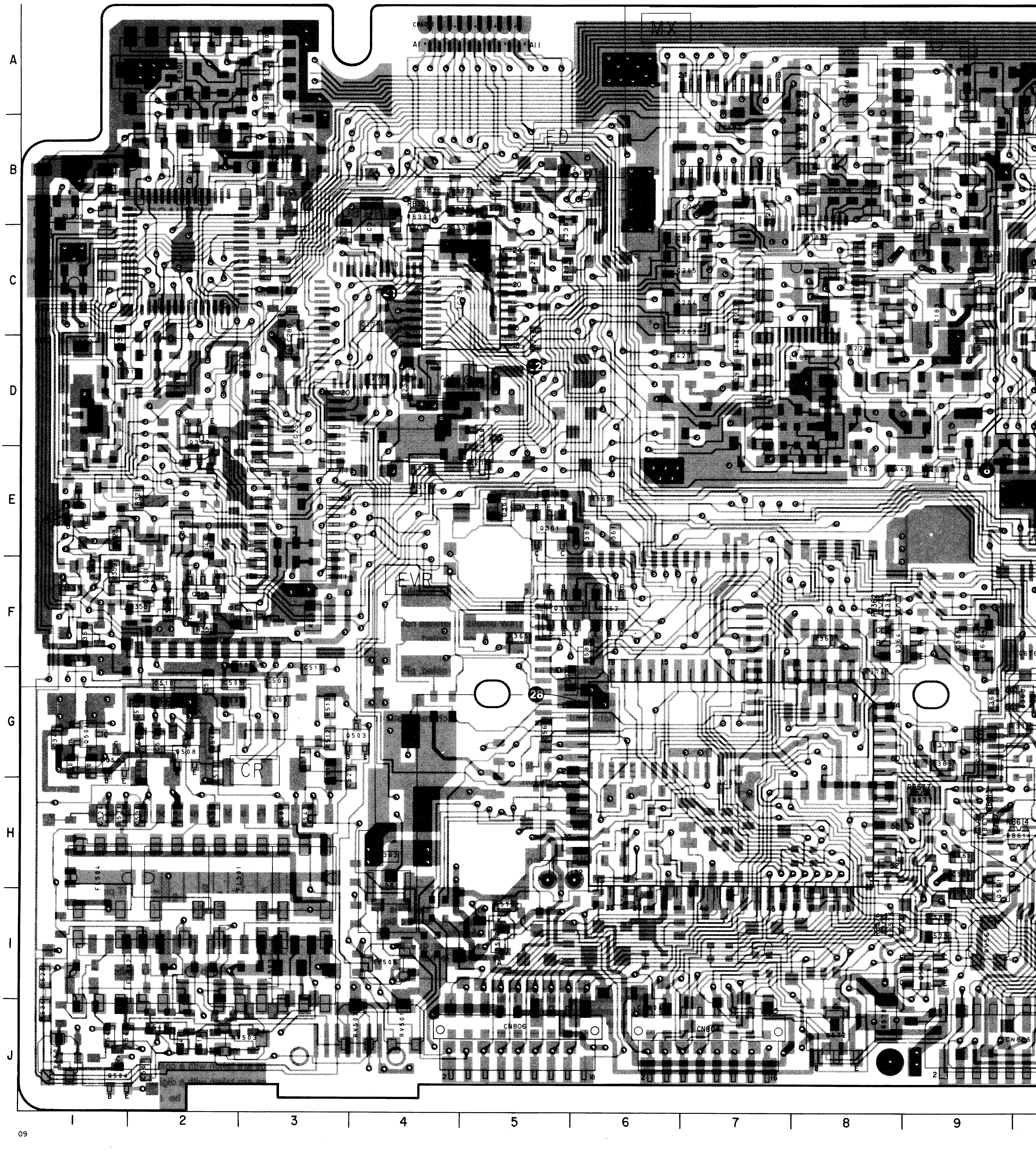
DIODE

D101	8-719-404-46	DIODE MA110
D102	8-719-404-46	DIODE MA110
D131	8-719-404-32	DIODE MA141WA
D132	8-719-404-46	DIODE MA110
D141	8-719-949-46	DIODE 1T32
D142	8-719-949-46	DIODE 1T32
D301	8-719-404-46	DIODE MA110
D361	8-719-404-32	DIODE MA141WA
D362	8-719-404-46	DIODE MA110
D561	8-719-404-49	DIODE MA111
D562	8-719-420-51	DIODE MA729
D563	8-719-404-46	DIODE MA110
D610	8-719-404-46	DIODE MA110
D611	8-719-404-32	DIODE MA141WA

IC

IC141	8-752-335-85	IC CXD2109Q
IC181	8-752-034-17	IC CXA1338R
IC182	8-752-329-79	IC CXL1505N
IC183	8-752-332-69	IC CXL5504M
IC251	8-752-034-21	IC CXA1339R
IC252	8-759-946-00	IC MB88341P
IC253	8-752-039-49	IC CXA1393A
IC301	8-752-033-34	IC CXA1072R
IC302	8-759-946-00	IC MB88341P
IC361	8-759-037-60	IC MC68HC05
IC362	8-759-937-56	IC S-8054AL
IC363	8-759-106-23	IC MC14066B
IC364	8-759-150-05	IC UPC324G2
IC501	8-759-144-23	IC UPC1037G
IC502	8-759-144-23	IC UPC1037G

VC-80 BOARD (COMPONENT SIDE)



DIODE MA110	
DIODE MA110	
DIODE MA141WA	
DIODE MA110	
DIODE 1T32	
DIODE 1T32	
DIODE MA110	
DIODE MA141WA	
DIODE MA110	
DIODE MA111	
DIODE MA729	
DIODE MA110	
DIODE MA110	
DIODE MA141WA	

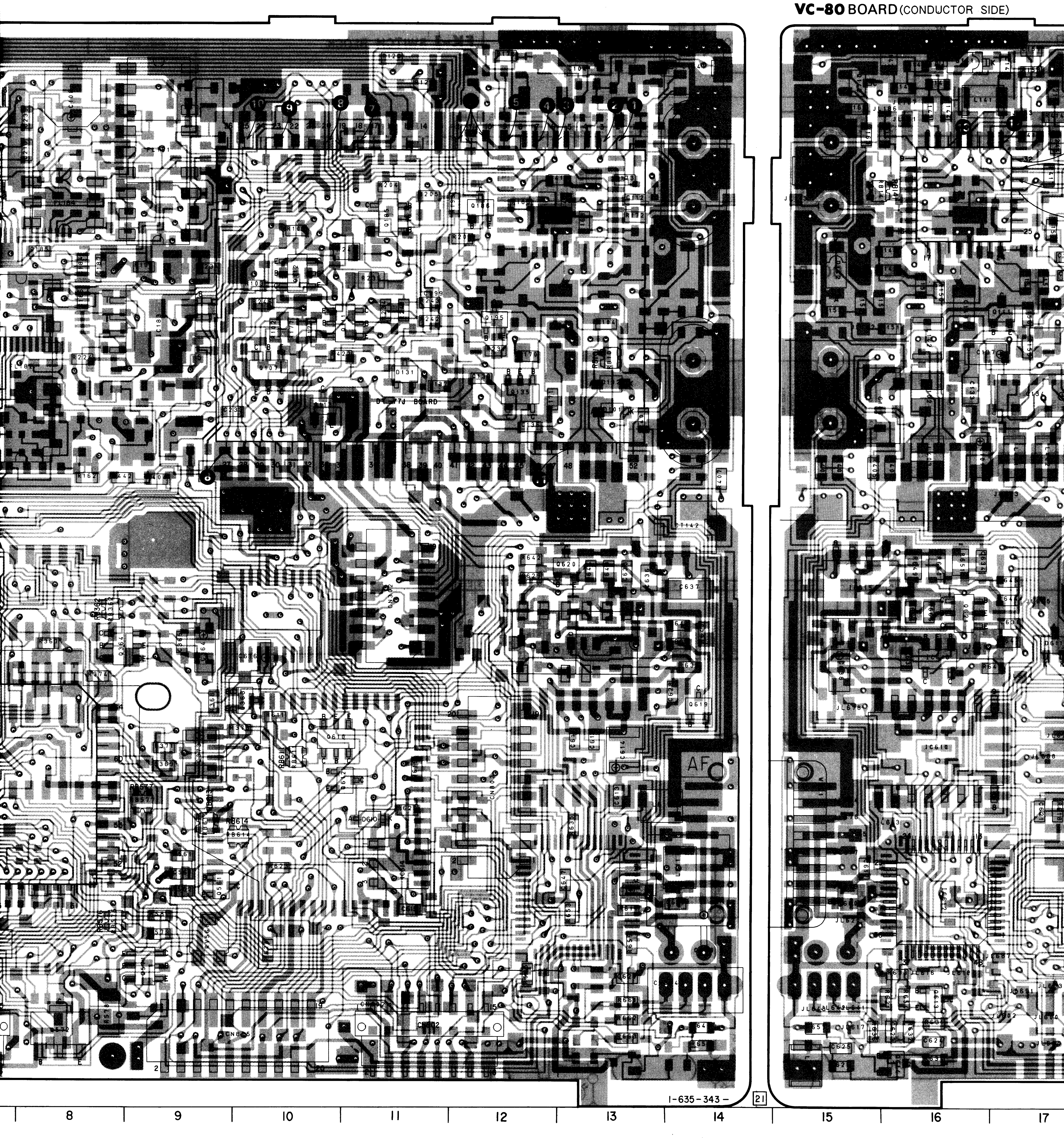
IC

IC141	8-752-335-85	IC CXD2109Q
IC181	8-752-034-17	IC CXA1338R
IC182	8-752-329-79	IC CXL1505N
IC183	8-752-332-69	IC CXL5504M
IC251	8-752-034-21	IC CXA1339R
IC252	8-759-946-00	IC MB88341PFV
IC253	8-752-039-49	IC CXA1393AN
IC301	8-752-033-34	IC CXA1072R
IC302	8-759-946-00	IC MB88341PFV
IC361	8-759-037-60	IC MC68HC05N4-SC406667
IC362	8-759-937-56	IC S-8054ALB-LM
IC363	8-759-106-23	IC MC14066BF
IC364	8-759-150-05	IC UPC324G2-E1
IC501	8-759-144-23	IC UPC1037GR
IC502	8-759-144-23	IC UPC1037GR
IC503	8-752-031-63	IC CXA1047M-T5
IC561	8-759-151-23	IC UPD7503GF-J51-3B8
IC610	8-752-334-49	IC CXD1172AM
IC611	8-759-502-04	IC MB88346PFV
IC612	8-752-326-18	IC CXD1204R
IC613	8-759-037-59	IC MC68HC05C4FU-SC411534
IC614	8-759-937-56	IC S-8054ALB-LM
IC615	8-759-100-94	IC UPC358G2
IC616	8-759-030-74	IC SC14S66FE

TRANSISTOR

Q101	8-729-402-84	TRANSISTOR XN4601
Q102	8-729-402-84	TRANSISTOR XN4601
Q106	8-729-602-36	TRANSISTOR 2SA1602
Q107	8-729-402-84	TRANSISTOR XN4601
Q111	8-729-402-84	TRANSISTOR XN4601
Q112	8-729-402-84	TRANSISTOR XN4601
Q113	8-729-921-58	TRANSISTOR DTA144TU
Q131	8-729-421-23	TRANSISTOR XN1501
Q132	8-729-117-32	TRANSISTOR 2SC4177
Q135	8-729-403-42	TRANSISTOR XN1401
Q141	8-729-117-32	TRANSISTOR 2SC4177
Q142	8-729-117-32	TRANSISTOR 2SC4177
Q181	8-729-117-32	TRANSISTOR 2SC4177
Q182	8-729-402-78	TRANSISTOR XN6401
Q183	8-729-602-36	TRANSISTOR 2SA1602
Q184	8-729-117-32	TRANSISTOR 2SC4177
Q185	8-729-421-23	TRANSISTOR XN1501
Q186	8-729-602-36	TRANSISTOR 2SA1602
Q189	8-729-602-36	TRANSISTOR 2SA1602
Q190	8-729-117-32	TRANSISTOR 2SC4177
Q191	8-729-402-78	TRANSISTOR XN6401
Q192	8-729-402-78	TRANSISTOR XN6401
Q193	8-729-402-78	TRANSISTOR XN6401
Q194	8-729-602-36	TRANSISTOR 2SA1602
Q195	8-729-602-36	TRANSISTOR 2SA1602
Q196	8-729-117-32	TRANSISTOR 2SC4177
Q255	8-729-402-84	TRANSISTOR XN4601
Q256	8-729-905-18	TRANSISTOR DTC144EU
Q257	8-729-402-84	TRANSISTOR XN4601
Q302	8-729-602-36	TRANSISTOR 2SA1602
Q303	8-7	
Q305	8-7	
Q307	8-7	
Q310	8-7	
Q311	8-7	
Q312	8-7	
Q313	8-7	
Q314	8-7	
Q315	8-7	
Q316	8-7	
Q317	8-7	
Q318	8-7	
Q361	8-7	
Q362	8-7	
Q363	8-7	

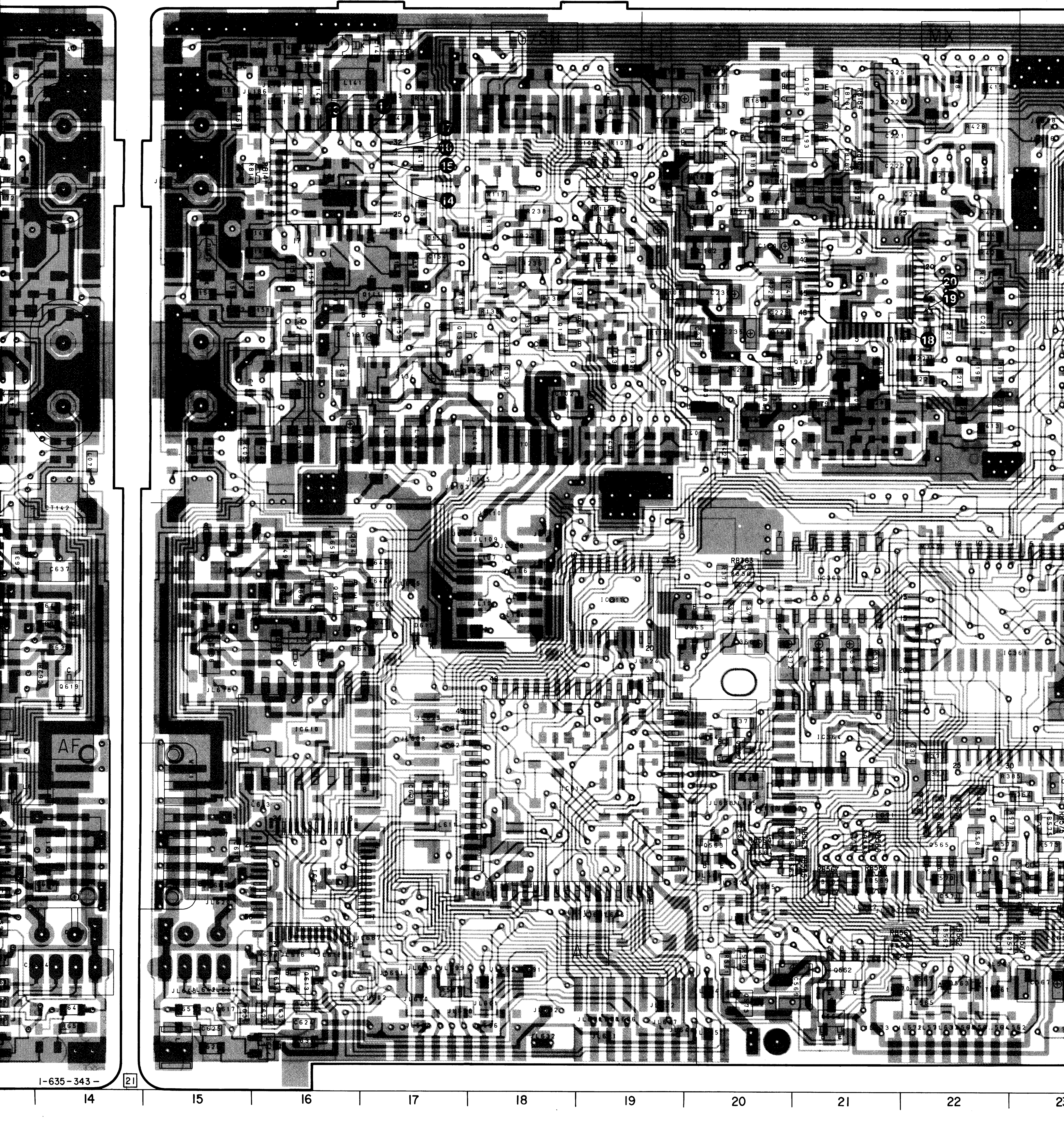
VC-80 BOARD (CONDUCTOR SIDE)



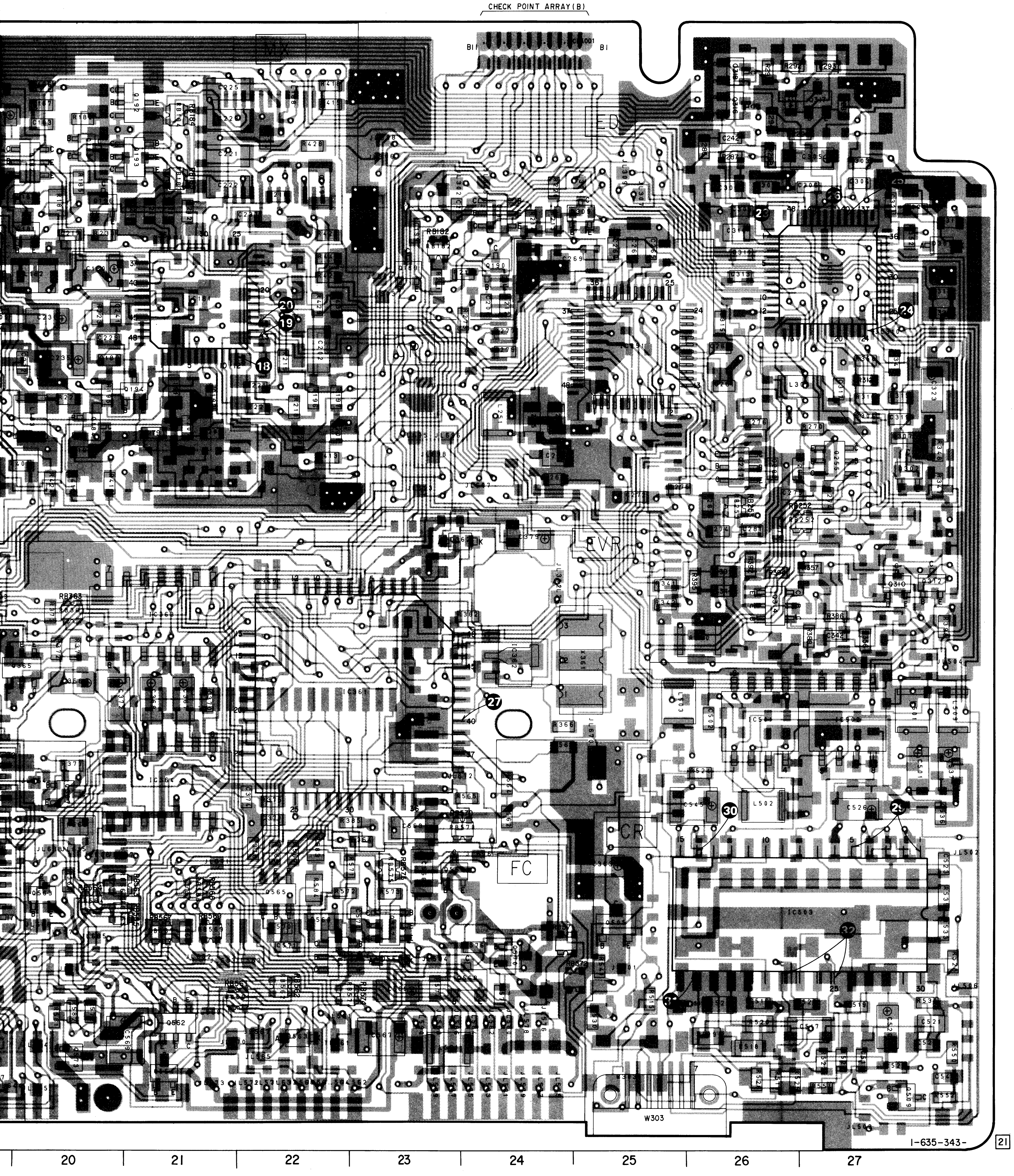
TRANSISTOR

Ref.	Part No.	Description
	9-402-84	TRANSISTOR XN4601
	9-402-84	TRANSISTOR XN4601
	9-602-36	TRANSISTOR 2SA1602
	9-402-84	TRANSISTOR XN4601
	9-402-84	TRANSISTOR XN4601
	9-402-84	TRANSISTOR XN4601
	9-921-58	TRANSISTOR DTA144TU
	9-421-23	TRANSISTOR XN1501
	9-117-32	TRANSISTOR 2SC4177
	9-403-42	TRANSISTOR XN1401
	9-117-32	TRANSISTOR 2SC4177
	9-117-32	TRANSISTOR 2SC4177
	9-117-32	TRANSISTOR 2SC4177
	9-402-78	TRANSISTOR XN6401
	9-602-36	TRANSISTOR 2SA1602
Q184	8-729-117-32	TRANSISTOR 2SC4177
Q185	8-729-421-23	TRANSISTOR XN1501
Q186	8-729-602-36	TRANSISTOR 2SA1602
Q189	8-729-602-36	TRANSISTOR 2SA1602
Q190	8-729-117-32	TRANSISTOR 2SC4177
Q191	8-729-402-78	TRANSISTOR XN6401
Q192	8-729-402-78	TRANSISTOR XN6401
Q193	8-729-402-78	TRANSISTOR XN6401
Q194	8-729-602-36	TRANSISTOR 2SA1602
Q195	8-729-602-36	TRANSISTOR 2SA1602
Q196	8-729-117-32	TRANSISTOR 2SC4177
Q255	8-729-402-84	TRANSISTOR XN4601
Q256	8-729-905-18	TRANSISTOR DTC144EU
Q257	8-729-402-84	TRANSISTOR XN4601
Q302	8-729-602-36	TRANSISTOR 2SA1602
Q303	8-729-602-36	TRANSISTOR 2SA1602
Q305	8-729-117-32	TRANSISTOR 2SC4177
Q307	8-729-402-81	TRANSISTOR XN4501
Q310	8-729-117-32	TRANSISTOR 2SC4177
Q311	8-729-117-32	TRANSISTOR 2SC4177
Q312	8-729-117-32	TRANSISTOR 2SC4177
Q313	8-729-403-42	TRANSISTOR XN1401
Q314	8-729-402-84	TRANSISTOR XN4601
Q315	8-729-602-36	TRANSISTOR 2SA1602
Q316	8-729-117-32	TRANSISTOR 2SC4177
Q317	8-729-117-32	TRANSISTOR 2SC4177
Q318	8-729-117-32	TRANSISTOR 2SC4177
Q361	8-729-403-07	TRANSISTOR XN1213
Q362	8-729-403-10	TRANSISTOR XN6215
Q363	8-729-117-32	TRANSISTOR 2SC4177
Q364	8-729-403-10	TRANSISTOR XN6215
Q365	8-729-402-78	TRANSISTOR XN6401
Q367	8-729-117-32	TRANSISTOR 2SC4177
Q368	8-729-403-10	TRANSISTOR XN6215
Q501	8-729-117-32	TRANSISTOR 2SC4177
Q502	8-729-117-32	TRANSISTOR 2SC4177
Q503	8-729-602-36	TRANSISTOR 2SA1602
Q504	8-729-117-32	TRANSISTOR 2SC4177
Q505	8-729-102-07	TRANSISTOR 2SC2223-F13
Q508	8-729-117-32	TRANSISTOR 2SC4177
Q509	8-729-602-36	TRANSISTOR 2SA1602
Q561	8-729-602-36	TRANSISTOR 2SA1602
Q562	8-729-403-24	TRANSISTOR XN4210
Q563	8-729-905-18	TRANSISTOR DTC144EU
Q564	8-729-921-08	TRANSISTOR DTC144TU
Q565	8-729-402-78	TRANSISTOR XN6401
Q566	8-729-402-19	TRANSISTOR XN6501
Q567	8-729-402-78	TRANSISTOR XN6401
Q568	8-729-109-44	TRANSISTOR 2SK94
Q569	8-729-602-36	TRANSISTOR 2SA1602
Q570	8-729-905-15	TRANSISTOR DTC144WU
Q571	8-729-920-39	TRANSISTOR IMT1US
Q572	8-729-805-25	TRANSISTOR 2SB1121
Q573	8-729-905-18	TRANSISTOR DTC144EU
Q610	8-729-403-10	TRANSISTOR XN6215
Q612	8-729-921-08	TRANSISTOR DTC144TU
Q613	8-729-117-32	TRANSISTOR 2SC4177
Q614	8-729-117-32	TRANSISTOR 2SC4177
Q619	8-729-117-32	TRANSISTOR 2SC4177
Q620	8-729-117-32	TRANSISTOR 2SC4177
Q621	8-729-402-19	TRANSISTOR XN6501

VC-80 BOARD (CONDUCTOR SIDE)



	-403-10	TRANSISTOR XN6215
	-402-78	TRANSISTOR XN6401
	-117-32	TRANSISTOR 2SC4177
	-403-10	TRANSISTOR XN6215
	-117-32	TRANSISTOR 2SC4177
	-117-32	TRANSISTOR 2SC4177
	-602-36	TRANSISTOR 2SA1602
	-117-32	TRANSISTOR 2SC4177
	-102-07	TRANSISTOR 2SC2223-F13
	-117-32	TRANSISTOR 2SC4177
	-602-36	TRANSISTOR 2SA1602
	-602-36	TRANSISTOR 2SA1602
	-403-24	TRANSISTOR XN4210
	-905-18	TRANSISTOR DTC144EU
	-921-08	TRANSISTOR DTC144TU
Q565	8-729-402-78	TRANSISTOR XN6401
Q566	8-729-402-19	TRANSISTOR XN6501
Q567	8-729-402-78	TRANSISTOR XN6401
Q568	8-729-109-44	TRANSISTOR 2SK94
Q569	8-729-602-36	TRANSISTOR 2SA1602
Q570	8-729-905-15	TRANSISTOR DTC144WU
Q571	8-729-920-39	TRANSISTOR IMT1US
Q572	8-729-805-25	TRANSISTOR 2SB1121
Q573	8-729-905-18	TRANSISTOR DTC144EU
Q610	8-729-403-10	TRANSISTOR XN6215
Q612	8-729-921-08	TRANSISTOR DTC144TU
Q613	8-729-117-32	TRANSISTOR 2SC4177
Q614	8-729-117-32	TRANSISTOR 2SC4177
Q619	8-729-117-32	TRANSISTOR 2SC4177
Q620	8-729-117-32	TRANSISTOR 2SC4177
Q621	8-729-402-19	TRANSISTOR XN6501



VC-80 (CAMERA) SCHEMATIC DIAGRAMS

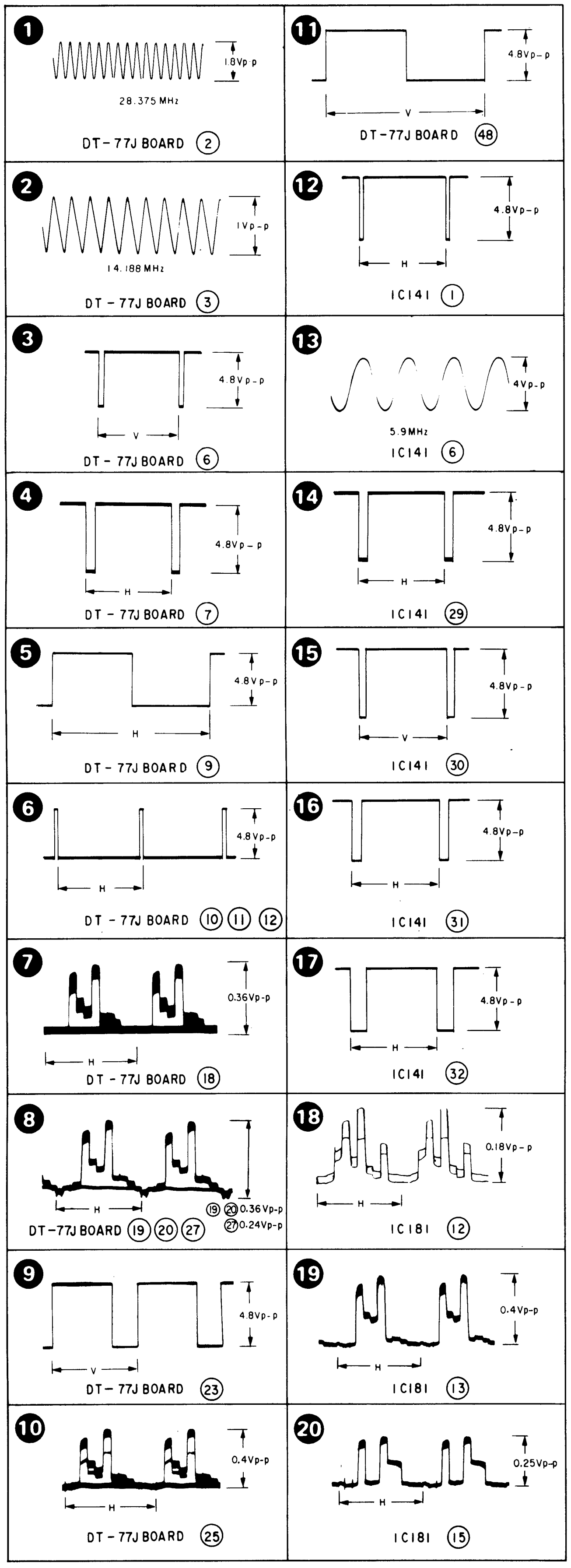
— Ref. No. VC-80 BOARD: 2000 series —

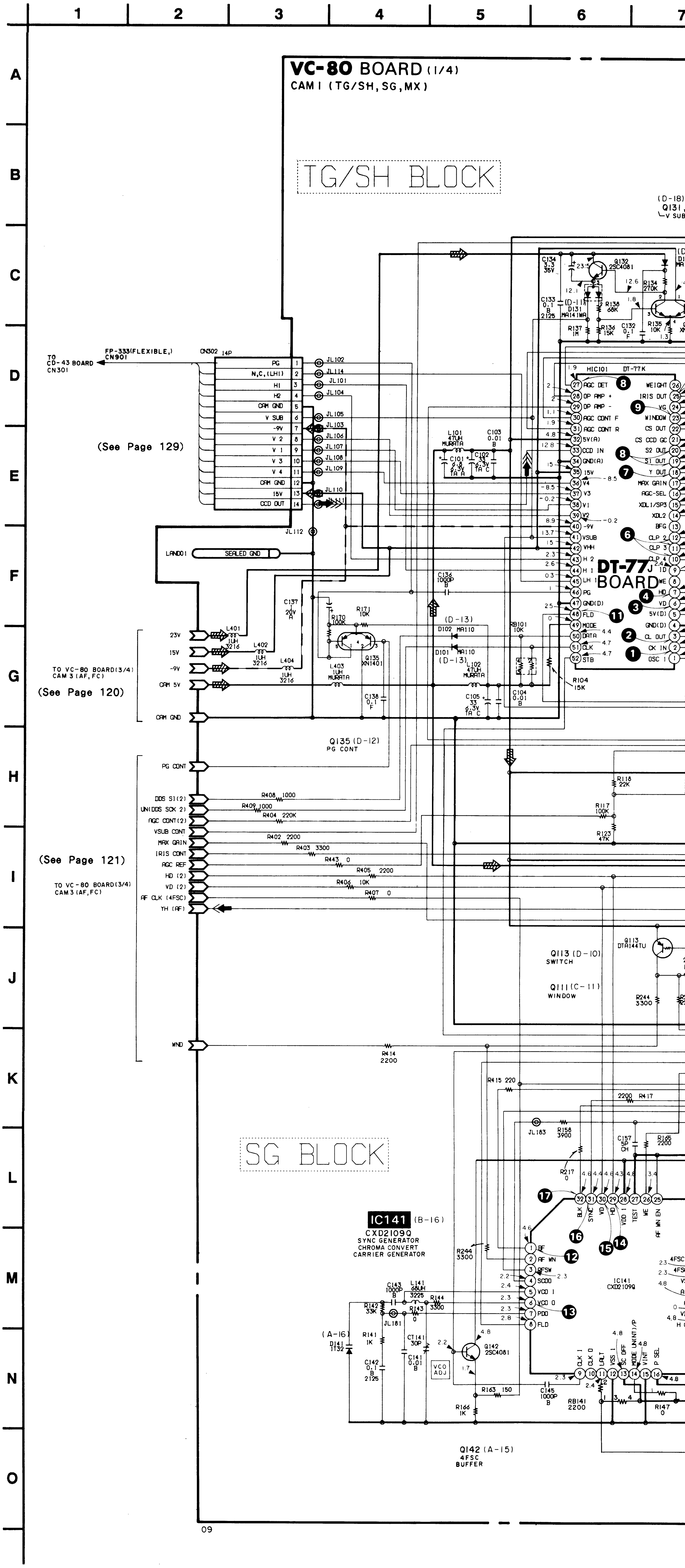
- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	⇛	⇛⇛	
PB				

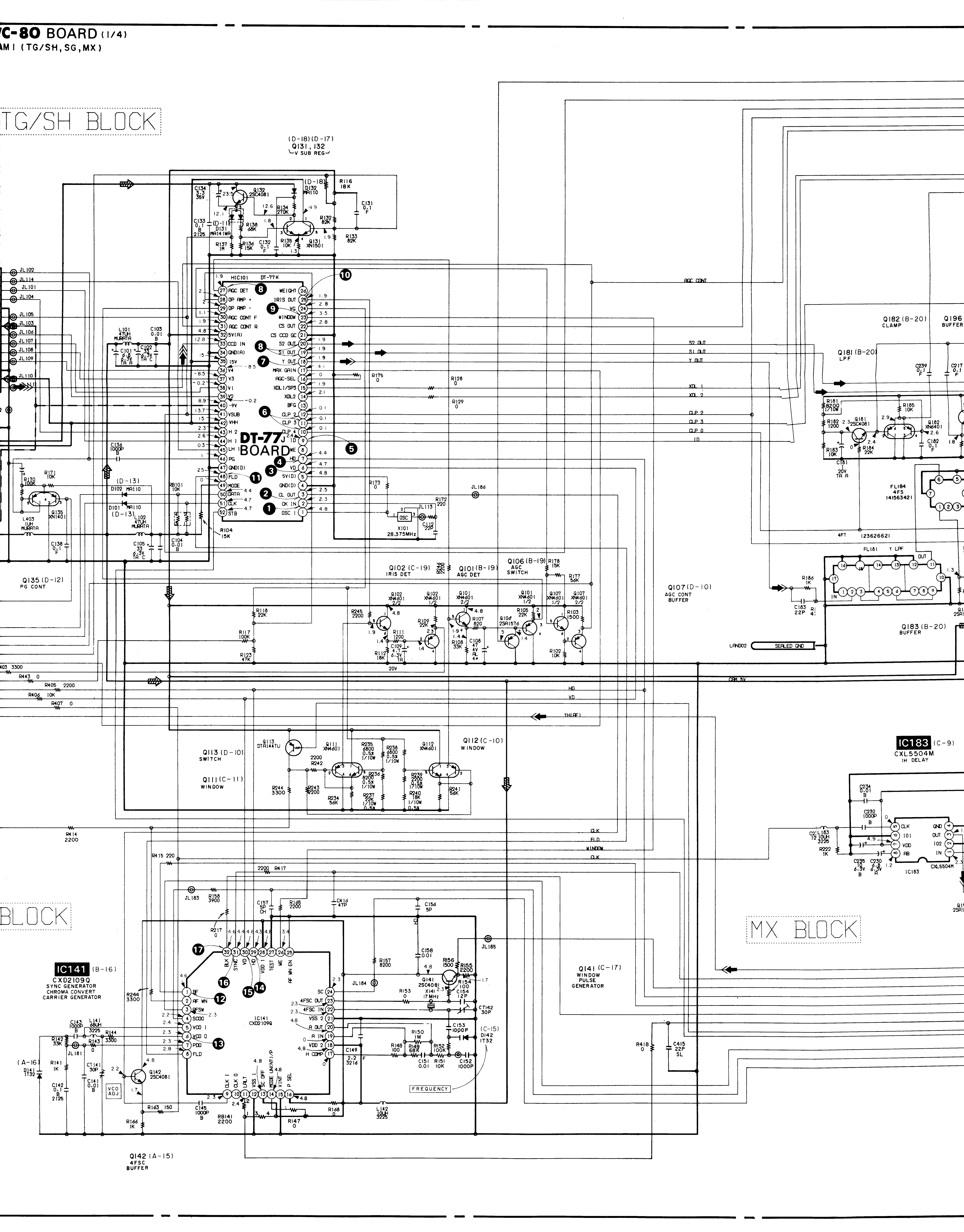
VC-80 BOARD (TG/SH, SG, MX)

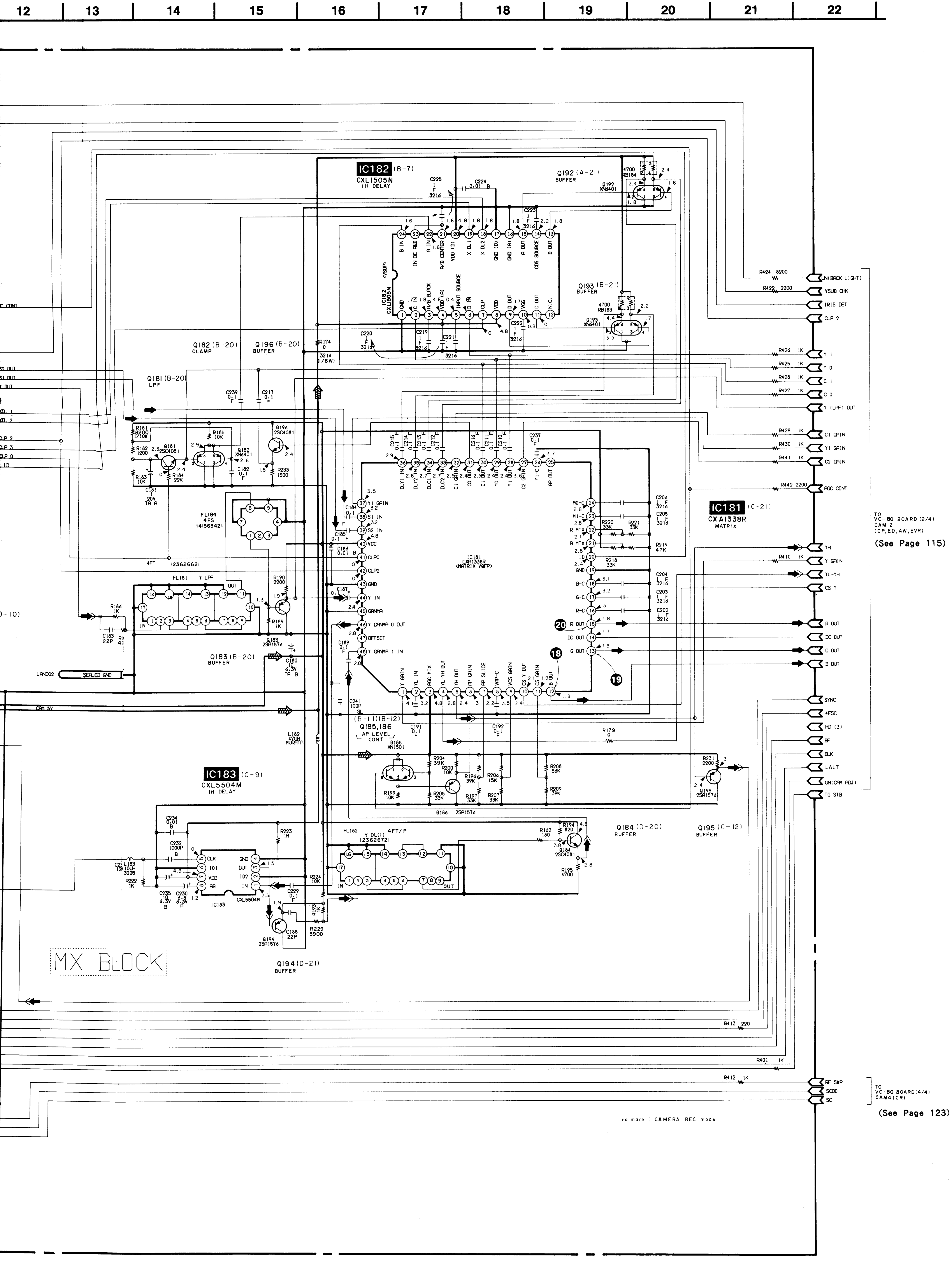




1 2 3 4 5 6 7
A B C D E F G H I J K L M N O
VC-80 BOARD (1/4)
CAM I (TG/SH, SG, MX)
TG/SH BLOCK
SG BLOCK
TO CD-43 BOARD CN301
FP-333(FLEXIBLE) CN901
CN302 14P
(See Page 129)
TO VC-80 BOARD(3/4) CAM 3 (AF, FC)
(See Page 120)
(See Page 121)
TO VC-80 BOARD(3/4) CAM 3 (AF, FC)
HIC101 DT-77K
DT-77J BOARD
Q135 (D-12) PG CONT
Q113 (D-10) SWITCH
Q111 (C-11) WINDOW
IC141 (B-16) CXD2109Q SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
Q142 (A-15) 4FSC BUFFER
LAND01 SEALED GND
09

C-80 BOARD (1/4)
AM I (TG/SH, SG, MX)

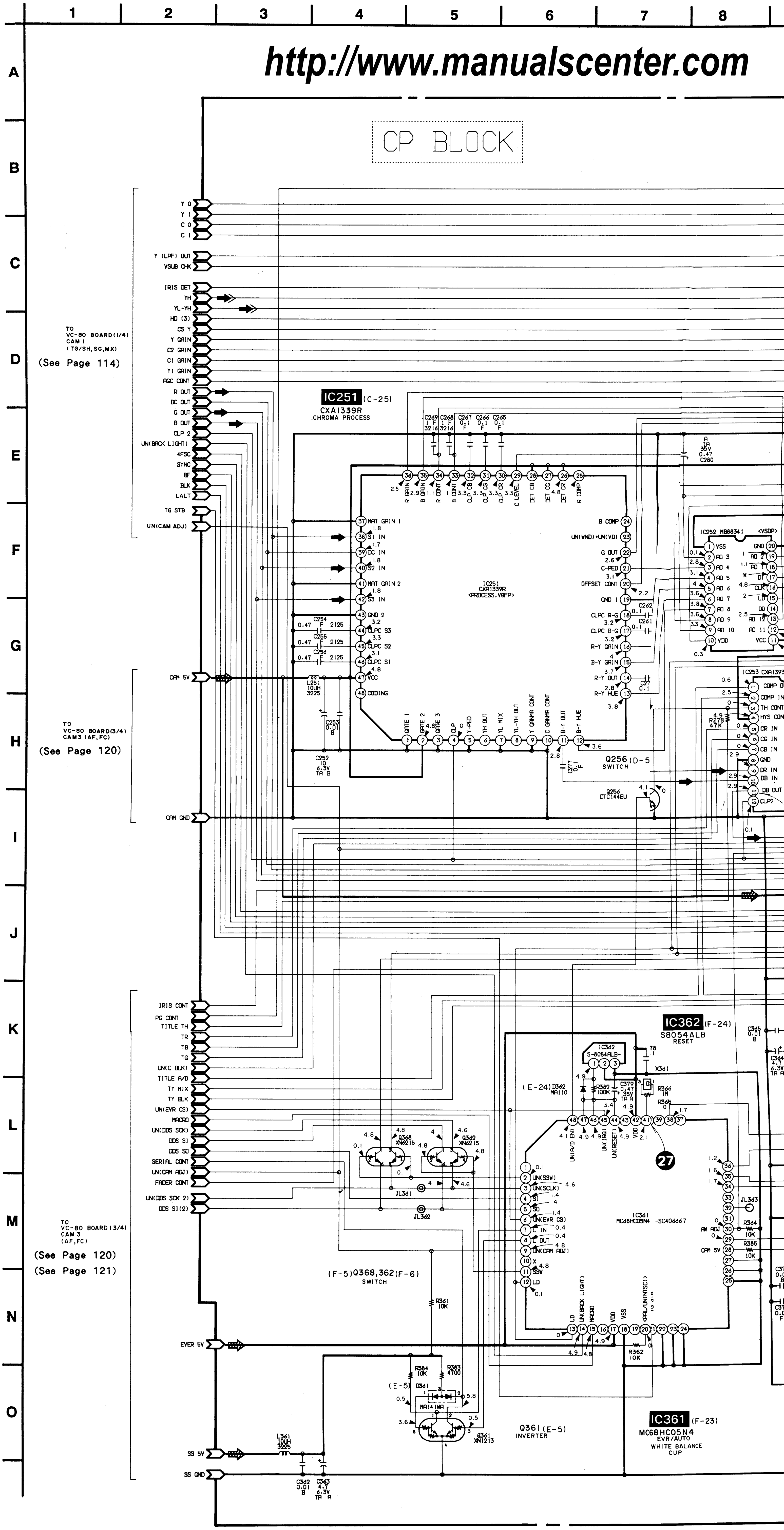

4
5
6
7
8
9
10
11
12
13
14
15
TG/SH BLOCK
(D-18) (D-17)
Q131, 132
V SUB REG
HIC101 DT-77K
AGC DET
OP AMP +
OP AMP −
AGC CONT F
AGC CONT R
5V(A)
CCD IN
GND(A)
15V
V4
V3
V1
V2
-9V
VSUB
VHH
H 2
H 1
LH 1
PG
GND(D)
FLD
MODE
DATA
CLK
STB
WEIGHT
IRIS OUT
VG
WINDOW
CS OUT
CS CCD GC
S2 OUT
S1 OUT
Y OUT
MAX GAIN
AGC-SEL
XDL1/SP3
XDL2
BFG
CLP 2
CLP 3
CLP 4
ID
WE
HD
VD
5V(D)
GND(D)
CL OUT
CK IN
OSC 1
DT-77 BOARD
X101 28.375MHz
Q135 (D-12) PG CONT
Q102 (C-19) IRIS DET
Q101 (B-19) AGC DET
Q106 (B-19) AGC SWITCH
Q107 (D-10) AGC CONT BUFFER
AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP 2
CLP 3
CLP 0
ID
HD
VD
YH(AF)
CAM 5V
LAND02
SEALED GND
Q182 (B-20) CLAMP
Q196 BUFFER
Q181 (B-20) LPF
FL184 4FS 141563421
4FT 123626621
FL181 Y LPF
Q183 (B-20) BUFFER
Q113 (D-10) SWITCH
Q111 (C-11) WINDOW
Q112 (C-10) WINDOW
IC183 (C-9) CXL5504M 1H DELAY
CLK
FLD
WINDOW
BLOCK
IC141 (B-16) CXD2109Q SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
BF
AF WN
BFSW
SCOO
VCO I
VCO O
PDO
FLD
BLK
SYNC
VD
HD
VDD 1
TEST
WE
AF WN EN
SC
4FSC OUT
4FSC IN
VSS 2
A OUT
A IN
VDD 2
H COMP
CLK I
CLK O
LALT
VSS 1
SC OFF
MODE UN(NT)/P
VINT
P SEL
Q141 (C-17) WINDOW PULSE GENERATOR
X141 17MHz
FREQUENCY
VCO ADJ
Q142 (A-15) 4FSC BUFFER
MX BLOCK


12
13
14
15
16
17
18
19
20
21
22
IC182 (B-7)
CXL1505N
1H DELAY
Q192 (A-21)
BUFFER
Q192 XN6401
4700 RB184
Q193 (B-21)
BUFFER
4700 RB183
Q193 XN6401
B IN
IN DC RB
A IN
A/B CENTER
VDD (D)
X DL1
X DL2
GND (D)
GND (A)
A OUT
CDS SOURCE
B OUT
GND
C IN
A/B BLACK
VDD (A)
INPUT SOURCE
D IN
CLP
VDD
D OUT
VG
C OUT
N.C.
Q182 (B-20)
CLAMP
Q196 (B-20)
BUFFER
Q181 (B-20)
LPF
R174 0 3216 (1/8W)
Q181 2SC4081
Q182 XN6401
Q196 2SC4081
FL184
4FS
141563421
4FT 123626621
FL181 Y LPF
OUT
IN
Q183 2SA1576
Q183 (B-20)
BUFFER
LAND02
SEALED GND
CAM 5V
L182 47UH MURATA
IC183 (C-9)
CXL5504M
1H DELAY
CLK
101
VDD
RB
GND
OUT
102
IN
IC183
CXL5504M
Q194 2SA1576
Q194 (D-21)
BUFFER
MX BLOCK
IC181 (C-21)
CXA1338R
MATRIX
IC181
CXA1338R
<MATRIX VQFP>
DLY1 IN
DLY2 IN
DLC1 IN
DLC2 IN
C1 GAIN
C0 IN
C1 IN
Y0 OUT
Y1 OUT
C2 GAIN
Y1-C
AP OUT
Y1 GAIN
S1 IN
S2 IN
VCC
CLP0
CLP2
GND
Y IN
GAMMA
Y GAMMA 0 OUT
OFFSET
Y GAMMA 1 IN
M0-C
M1-C
R MTX
B MTX
ID
GND
B-C
G-C
R-C
R OUT
DC OUT
G OUT
Y GAIN
YL IN
AGC MIX
YL-YH OUT
YH OUT
AP GAIN
AP SLICE
VAP-C
VCS GAIN
CS Y OUT
CS
B GAIN
⑳
⑱
⑲
(B-11)(B-12)
Q185,186
AP LEVEL CONT
Q185 XN1501
Q186 2SA1576
Q195 2SA1576
FL182 Y DL(1) 4FT/P
123626721
Q184 (D-20)
BUFFER
Q184 2SC4081
Q195 (C-12)
BUFFER
UN(BACK LIGHT)
VSUB CHK
IRIS DET
CLP 2
Y 1
Y 0
C 1
C 0
Y (LPF) OUT
C1 GAIN
Y1 GAIN
C2 GAIN
AGC CONT
YH
Y GAIN
YL-YH
CS Y
R OUT
DC OUT
G OUT
B OUT
SYNC
4FSC
HD (3)
BF
BLK
LALT
UN(CAM ADJ)
TG STB
TO VC-80 BOARD (2/4) CAM 2 (CP,ED,AW,EVR)
(See Page 115)
RF SWP
SCDD
SC
TO VC-80 BOARD(4/4) CAM4(CR)
(See Page 123)
R424 8200
R422 2200
R426 1K
R425 1K
R428 1K
R427 1K
R429 1K
R430 1K
R441 1K
R442 2200
R410 1K
R413 220
R401 1K
R412 1K
no mark : CAMERA REC mode

VC-80 (CAMERA) SCHEMATIC DIAGRAMS

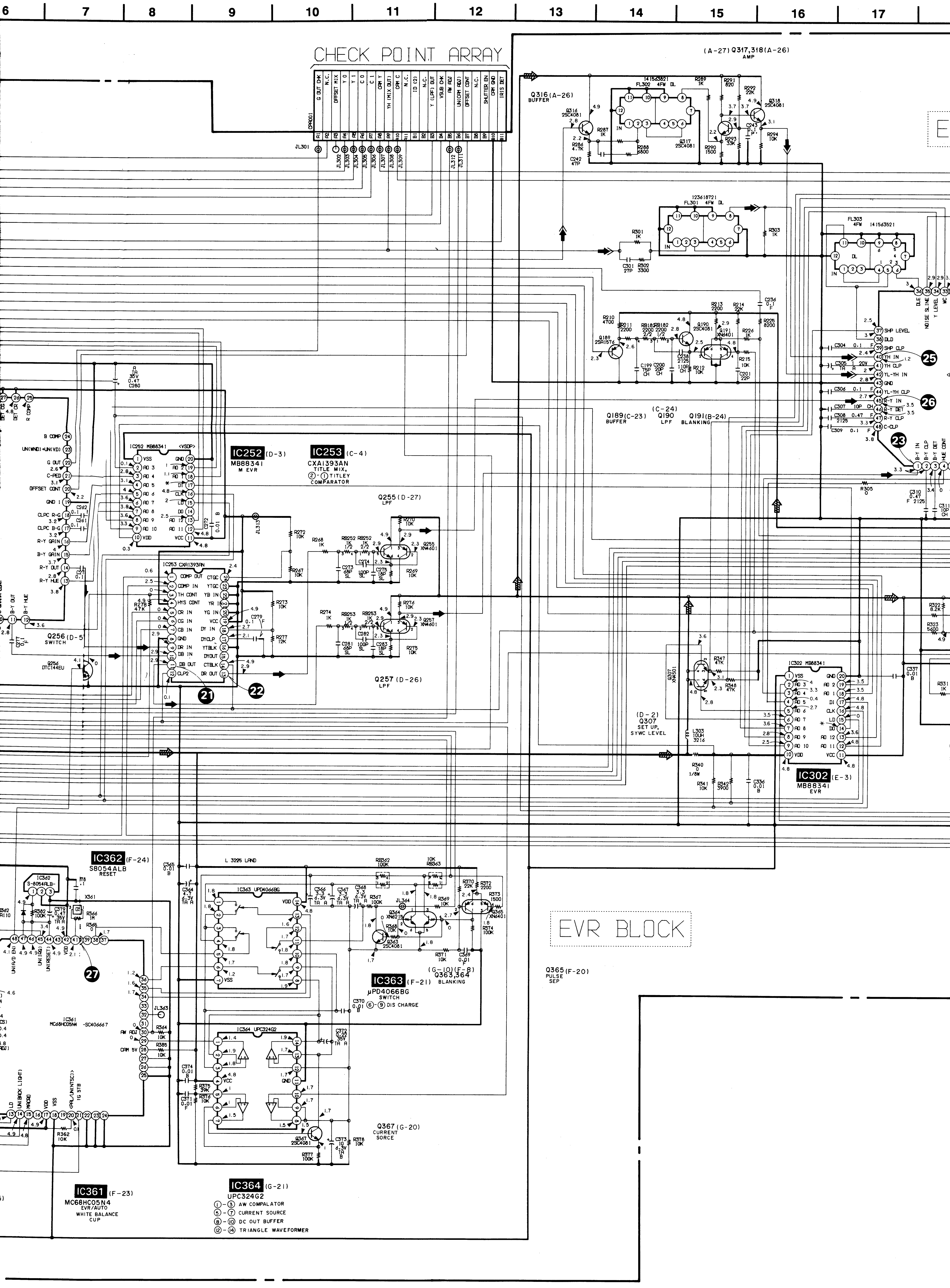
— Ref. No. VC-80 BOARD: 2000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


CP BLOCK
Y 0
Y 1
C 0
C 1
Y (LPF) OUT
VSUB CHK
IRIS DET
YH
YL-YH
HD (3)
CS Y
Y GAIN
C2 GAIN
C1 GAIN
Y1 GAIN
AGC CONT
R OUT
DC OUT
G OUT
B OUT
CLP 2
UN(BACK LIGHT)
4FSC
SYNC
BF
BLK
LALT
TG STB
UN(CAM ADJ)
TO VC-80 BOARD(1/4) CAM 1 (TG/SH,SG,MX)
(See Page 114)
CAM 5V
CAM GND
TO VC-80 BOARD(3/4) CAM3 (AF,FC)
(See Page 120)
IC251 (C-25)
CXA1339R
CHROMA PROCESS
IC251 CXA1339R <PROCESS,VQFP>
IC252 MB88341
IC253 CXA1393
Q256 (D-5
SWITCH
Q256 DTC144EU
L251 10UH 3225
IRIS CONT
PG CONT
TITLE TH
TR
TB
TG
UN(C BLK)
TITLE A/D
TY MIX
TY BLK
UN(EVR CS)
MACRO
UN(DDS SCK)
DDS SI
DDS SO
SERIAL CONT
UN(CAM ADJ)
FADER CONT
UN(DDS SCK 2)
DDS SI(2)
TO VC-80 BOARD (3/4) CAM 3 (AF,FC)
(See Page 120)
(See Page 121)
IC362 (F-24)
S8054ALB
RESET
(E-24) D362 MA110
X361
Q368 XN6215
Q362 XN6215
JL361
JL362
(F-5)Q368,362(F-6)
SWITCH
R361 10K
EVER 5V
R364 10K
R363 4700
(E-5) D361
MA141WA
Q361 XN1213
Q361 (E-5)
INVERTER
IC361 MC68HC05N4 -SC406667
IC361 (F-23)
MC68HC05N4
EVR/AUTO WHITE BALANCE CUP
27
L361 10UH 3225
SS 5V
SS GND
C362 0.01 B
C363 4.7 6.3V TA A
R362 10K

09

CAMERA **CAMERA**


6
7
8
9
10
11
12
13
14
15
16
17
CHECK POINT ARRAY
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CAM Y
YH (MIX OUT)
CAM C
N.C.
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
UN(CAM ADD)
OFFSET CONT
N.C.
SHUTTER EN
CAM GND
IRIS DET
CP8001
JL301
(A-27) Q317,318(A-26) AMP
Q316(A-26) BUFFER
FL302 4FW DL
FL301 4FW DL
FL303 4FW
Q189(C-23) BUFFER
(C-24) Q190 LPF
Q191(B-24) BLANKING
IC252 (D-3)
MB88341
M EVR
IC253 (C-4)
CXA1393AN
TITLE MIX,
②-① TITLEY COMPARATOR
Q255(D-27) LPF
Q257(D-26) LPF
Q256(D-5) SWITCH
(D-2) Q307 SET UP, SYWC LEVEL
IC302 (E-3)
MB88341
EVR
IC362 (F-24)
S8054ALB
RESET
IC363 (F-21)
μPD4066BG
SWITCH
(G-10)(F-8) Q363,364 BLANKING
EVR BLOCK
Q365(F-20) PULSE SEP
Q367(G-20) CURRENT SORCE
IC361 (F-23)
MC68HC05N4
EVR/AUTO WHITE BALANCE CUP
IC364 (G-21)
UPC324G2
①-③ AW COMPALATOR
⑤-⑦ CURRENT SOURCE
⑧-⑩ DC OUT BUFFER
⑫-⑭ TRIANGLE WAVEFORMER
㉑
㉒
㉓
㉕
㉖
㉗

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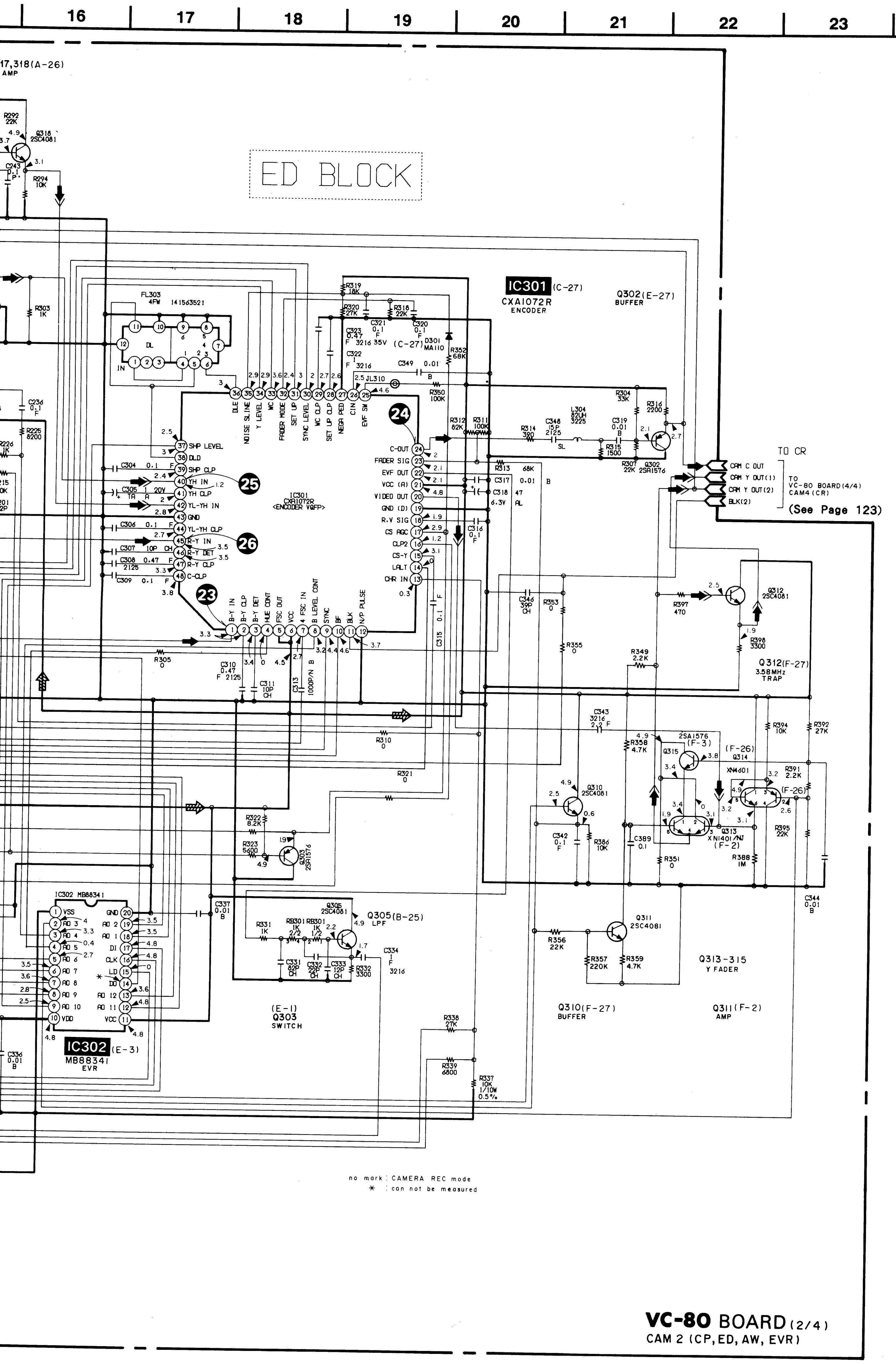
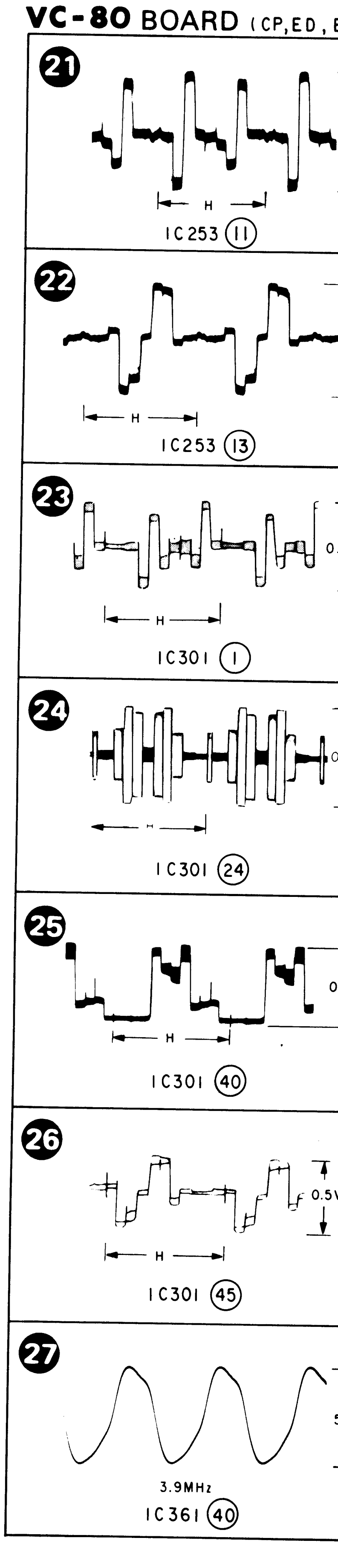

16
17
18
19
20
21
22
23
ED BLOCK
IC301 (C-27)
CXA1072R
ENCODER
Q302 (E-27)
BUFFER
TO CR
TO VC-80 BOARD (4/4) CAM4 (CR)
(See Page 123)
Q312 (F-27)
3.58MHz TRAP
IC302 (E-3)
MB88341
EVR
Q305 (B-25)
LPF
(E-1)
Q303
SWITCH
Q310 (F-27)
BUFFER
Q311 (F-2)
AMP
Q313-315
Y FADER

no mark : CAMERA REC mode
* : can not be measured

VC-80 BOARD (2/4)
CAM 2 (CP, ED, AW, EVR)



http://www.manualscenter.com

- **SIGNAL PATH**

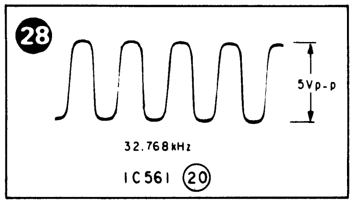
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	⇛		
PB				

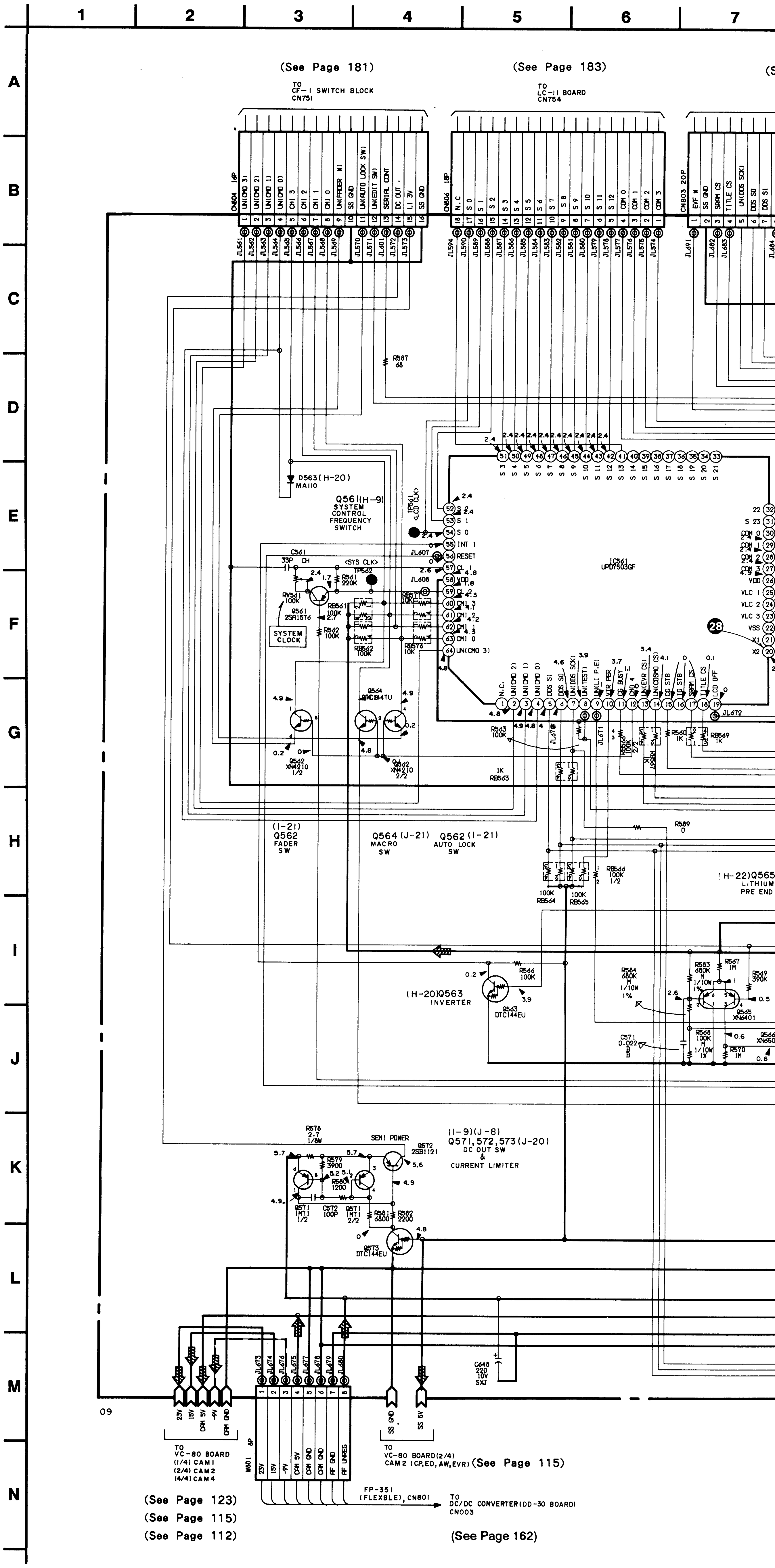
VC-80 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. VC-80 BOARD: 2000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates t
position of location address on the printed wiring board.

VC-80 BOARD (AF, FC)



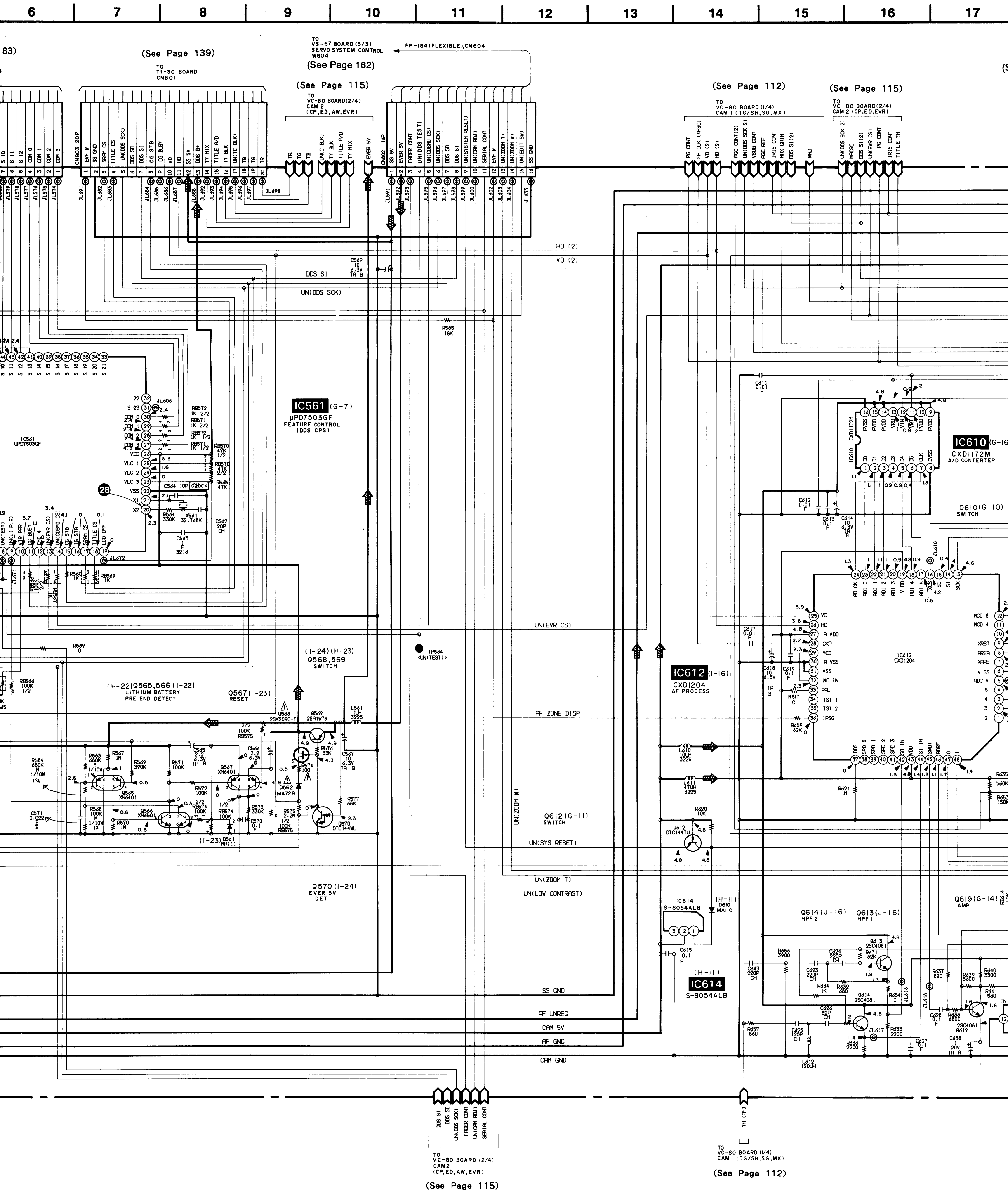


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
K
L
M
N
(See Page 181)
TO CF-I SWITCH BLOCK CN751
(See Page 183)
TO LC-II BOARD CN754
CN504 16P
CN566 18P
CN803 20P
R587 68
D563(H-20) MA110
Q561(H-9) SYSTEM CONTROL FREQUENCY SWITCH
TP561 <LCD CLK>
C561 33P CH
<SYS CLK> TP562
RV561 100K
Q561 2SA1576
R561 220K
SYSTEM CLOCK
R562 100K
RB561 100K
RB562 100K
RB577 10K
RB576 10K
IC561 UPD7503GF
Q564 DTC144TU
Q562 XN4210 1/2
Q562 XN4210 2/2
R563 100K
RB563 1K
RB568 1K
RB569 1K
RB560 1K
R589 0
(I-21) Q562 FADER SW
Q564 (J-21) MACRO SW
Q562 (I-21) AUTO LOCK SW
RB564 100K
RB565 100K
RB566 100K 1/2
(H-22)Q565 LITHIUM PRE END
(H-20)Q563 INVERTER
R566 100K
Q563 DTC144EU
R584 680K 1/10W 1%
R583 680K 1/10W 1%
R567 1M
R549 390K
Q565 XN6401
R568 100K 1/10W 1%
R570 1M
C571 0.022 B
R578 2.7 1/8W
SEMI POWER
Q572 2SB1121
(I-9)(J-8) Q571,572,573(J-20) DC OUT SW & CURRENT LIMITER
R579 3900
R580 1200
Q571 IMT1 1/2
C572 100P
Q571 IMT1 2/2
R581 6800
R582 2200
Q573 DTC144EU
C646 220 10V SXJ
09
CN801 8P
TO VC-80 BOARD (1/4) CAM1 (2/4) CAM2 (4/4) CAM4
(See Page 123)
(See Page 115)
(See Page 112)
TO VC-80 BOARD(2/4) CAM2 (CP,ED,AW,EVR) (See Page 115)
FP-351 (FLEXBLE), CN801
TO DC/DC CONVERTER(DD-30 BOARD) CN003
(See Page 162)

ns.

for each semiconductor indicates the

s on the printed wiring board.



6
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8
9
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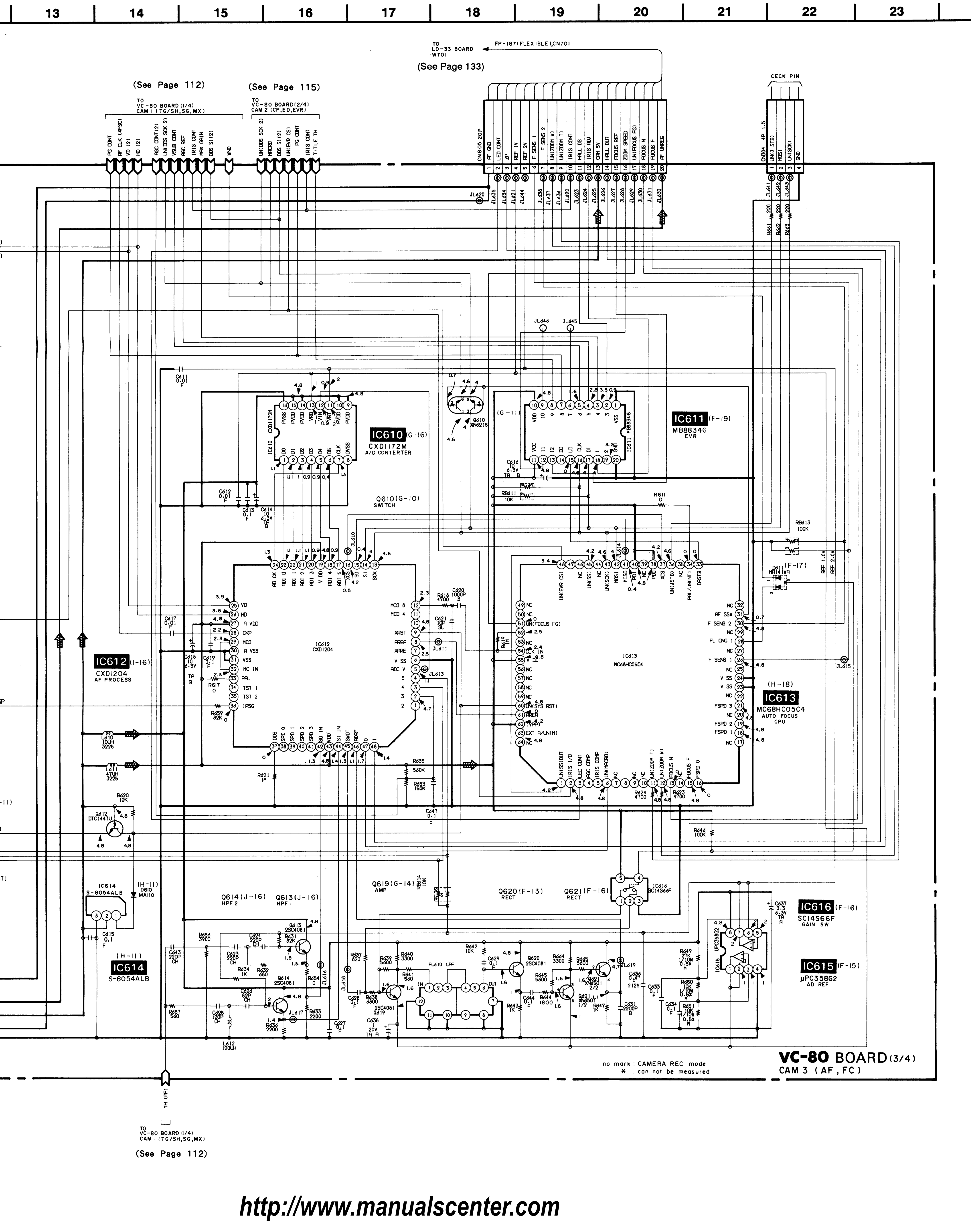
11
12
13
14
15
16
17
(See Page 139)
TO TI-30 BOARD CN801
TO VS-67 BOARD(3/3) SERVO SYSTEM CONTROL W604
FP-184(FLEXIBLE),CN604
(See Page 162)
(See Page 115)
TO VC-80 BOARD(2/4) CAM 2 (CP,ED,AW,EVR)
(See Page 112)
TO VC-80 BOARD(1/4) CAM 1 (TG/SH,SG,MX)
(See Page 115)
TO VC-80 BOARD(2/4) CAM 2 (CP,ED,EVR)
CN803 20P
CN602 16P
HD (2)
VD (2)
DDS SI
UN(DDS SCK)
R585 18K
IC561 (G-7)
μPD7503GF
FEATURE CONTROL (DDS CPS)
IC561 UPD7503GF
IC610 (G-16)
CXD1172M
A/D CONTERTER
Q610(G-10) SWITCH
IC612 (I-16)
CXD1204
AF PROCESS
IC612 CXD1204
UN(EVR CS)
TP564 <UN(TEST)>
(I-24)(H-23) Q568,569 SWITCH
(H-22)Q565,566(I-22) LITHIUM BATTERY PRE END DETECT
Q567(I-23) RESET
AF ZONE DISP
Q612(G-11) SWITCH
UN(SYS RESET)
UN(ZOOM T)
UN(LOW CONTRAST)
UN(ZOOM W)
Q570(I-24) EVER 5V DET
IC614 S-8054ALB
(H-11) D610 MA110
(H-11) IC614 S-8054ALB
Q614(J-16) HPF 2
Q613(J-16) HPF 1
Q619(G-14) AMP
SS GND
AF UNREG
CAM 5V
AF GND
CAM GND
DDS SI
DDS SO
UN(DDS SCK)
FADER CONT
UN(CAM ADJ)
SERIAL CONT
YH (AF)
TO VC-80 BOARD (2/4) CAM2 (CP,ED,AW,EVR)
(See Page 115)
TO VC-80 BOARD (1/4) CAM 1 (TG/SH,SG,MX)
(See Page 112)


13
14
15
16
17
18
19
20
21
22
23
(See Page 112)
TO VC-80 BOARD(1/4) CAM 1 (TG/SH,SG,MX)
(See Page 115)
TO VC-80 BOARD(2/4) CAM 2 (CP,ED,EVR)
TO LD-33 BOARD W701
FP-187(FLEXIBLE),CN701
(See Page 133)
CECK PIN
CN805 20P
CN304 4P
IC610 (G-16)
CXD1172M
A/D CONTERTER
IC611 (F-19)
MB88346
EVR
IC612 (I-16)
CXD1204
AF PROCESS
IC613 (H-18)
MC68HC05C4
AUTO FOCUS CPU
IC614 (H-11)
S-8054ALB
IC615 (F-15)
µPC358G2
AD REF
IC616 (F-16)
SC14S66F
GAIN SW
Q610 (G-10) SWITCH
Q612 DTC144TU
Q613 (J-16) HPF 1
Q614 (J-16) HPF 2
Q619 (G-14) AMP
Q620 (F-13) RECT
Q621 (F-16) RECT
D610 MA110
D611 MA141WA (F-17)
FL610 LPF
TO VC-80 BOARD(1/4) CAM 1 (TG/SH,SG,MX)
(See Page 112)

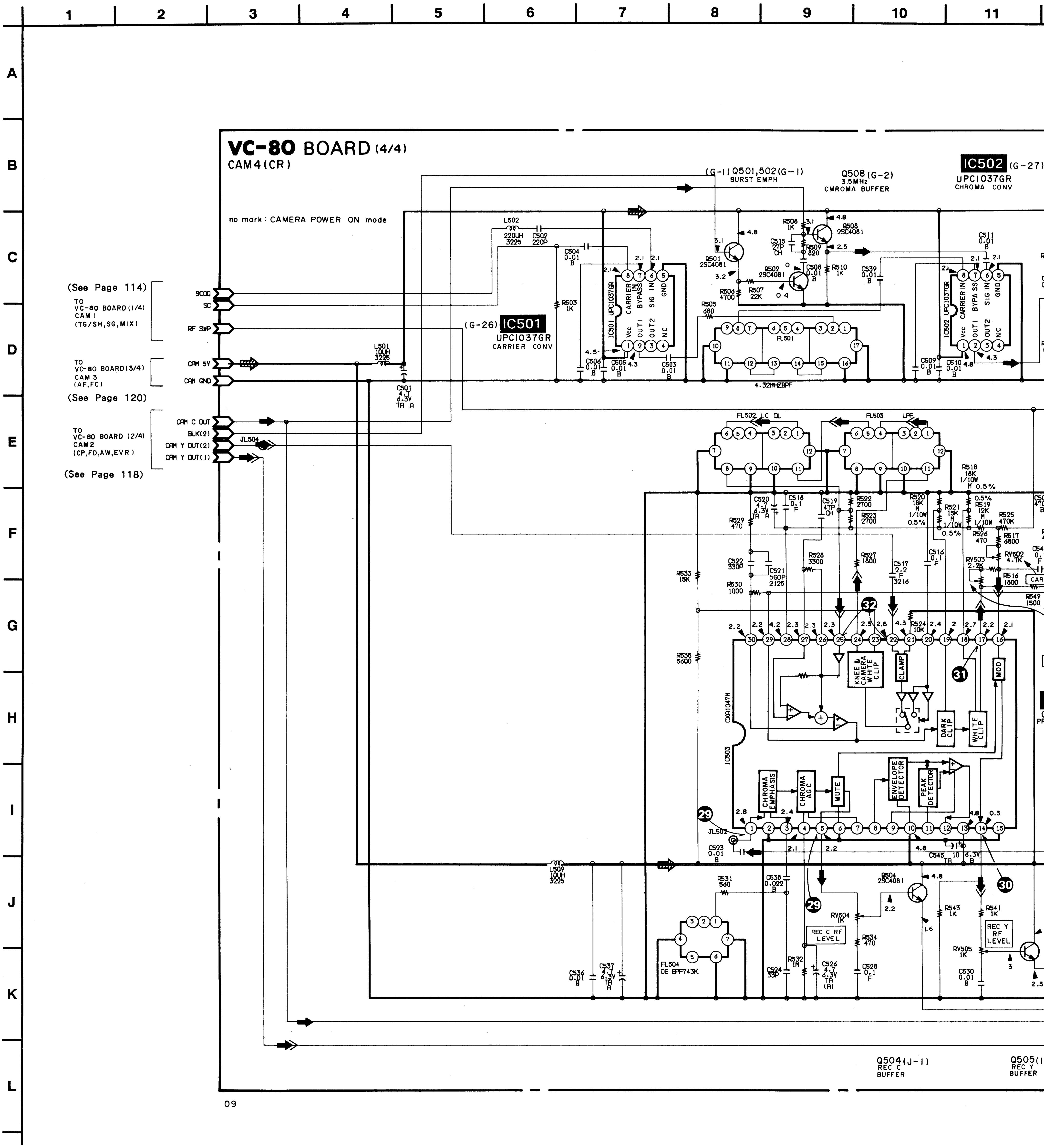
VC-80 BOARD (3/4)
CAM 3 (AF, FC)

no mark : CAMERA REC mode
* : can not be measured

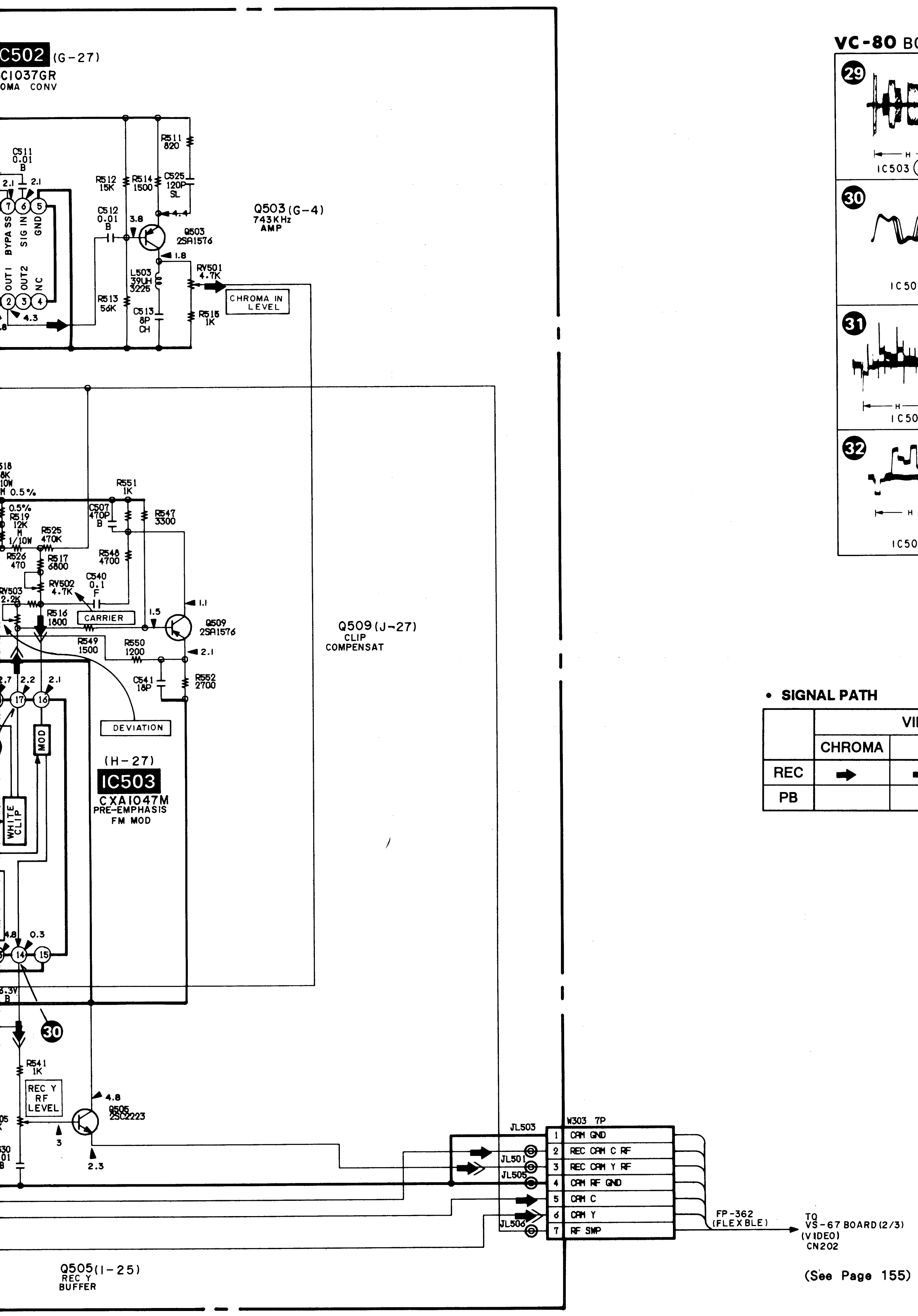
VC-80 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. VC-80 BOARD: 2000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

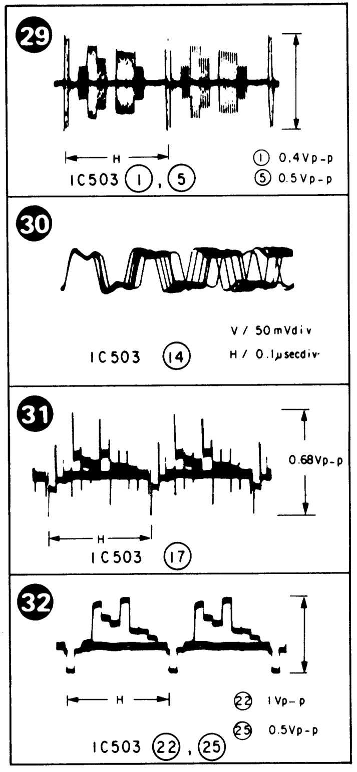


VC-80 BOARD (4/4)
CAM4(CR)
no mark : CAMERA POWER ON mode
(See Page 114)
TO VC-80 BOARD(1/4) CAM 1 (TG/SH,SG,MIX)
SCOO
SC
RF SWP
TO VC-80 BOARD(3/4) CAM 3 (AF,FC)
CAM 5V
CAM GND
(See Page 120)
TO VC-80 BOARD (2/4) CAM2 (CP,FD,AW,EVR)
CAM C OUT
BLK(2)
CAM Y OUT(2)
CAM Y OUT(1)
(See Page 118)
JL504
(G-26) IC501
UPC1037GR
CARRIER CONV
(G-1) Q501,502 (G-1)
BURST EMPH
Q508 (G-2)
3.5MHz
CMROMA BUFFER
IC502 (G-27)
UPC1037GR
CHROMA CONV
FL501
4.32MHZBPF
FL502 C DL
FL503 LPF
IC503
CXA1047M
KNEE & CAMERA WHITE CLIP
CLAMP
DARK CLIP
WHITE CLIP
MOD
CHROMA EMPHASIS
CHROMA AGC
MUTE
ENVELOPE DETECTOR
PEAK DETECTOR
JL502
FL504
CE BPF743K
REC C RF LEVEL
REC Y RF LEVEL
Q504 (J-1)
REC C BUFFER
Q505
REC Y BUFFER
09


C502 (G-27)
C1037GR
OMA CONV
C511 0.01 B
2.1
2.1
7 BYPA SS
6 SIG IN
5 GND
2 OUT1
3 OUT2
4 NC
4.3
R512 15K
R514 1500
R511 820
C525 120P SL
C512 0.01 B
3.8
4.4
Q503 2SA1576
1.8
L503 39UH 3225
R513 56K
C513 8P CH
RV501 4.7K
R515 1K
CHROMA IN LEVEL
Q503 (G-4)
743KHz
AMP
518
8K
10W
M 0.5%
0.5%
R519 12K M 1/10W
R525 470K
R526 470
R517 6800
RV503 2.2K
RV502 4.7K
R516 1800
C507 470P B
R551 1K
R547 3300
R548 4700
C540 0.1 F
CARRIER
1.1
1.5
Q509 2SA1576
R549 1500
R550 1200
2.1
C541 18P
R552 2700
2.7
2.2
2.1
17
16
MOD
WHITE CLIP
DEVIATION
(H-27)
IC503
CXA1047M
PRE-EMPHASIS
FM MOD
Q509 (J-27)
CLIP
COMPENSAT
4.8
0.3
14
15
3.3V
B
30
R541 1K
REC Y RF LEVEL
4.8
Q505 2SC2223
3
2.3
05
30
01
B
JL503
JL501
JL505
JL506
W303 7P
1 CAM GND
2 REC CAM C RF
3 REC CAM Y RF
4 CAM RF GND
5 CAM C
6 CAM Y
7 RF SMP
FP-362
(FLEXBLE)
TO
VS-67 BOARD (2/3)
(VIDEO)
CN202
Q505 (I-25)
REC Y
BUFFER

(See Page 155)

VC-80 BOARD (CR)

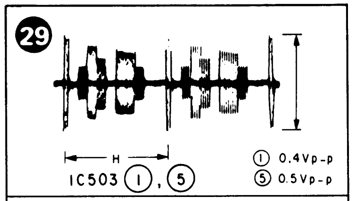


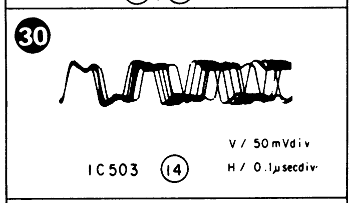
- **SIGNAL PATH**

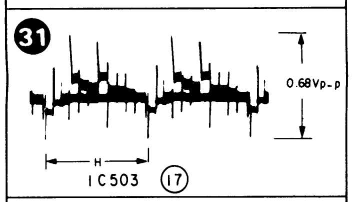
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	⇛		
PB				

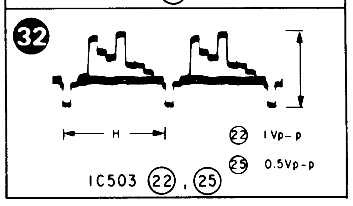
126

VC-80 BOARD (CR)









• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	⇛		
PB				

TO
VS-67 BOARD (2/3)
(VIDEO)
CN202

(See Page 155)

126

CD-43 (CCD IMAGER) PRINTED WIRING BOARDS

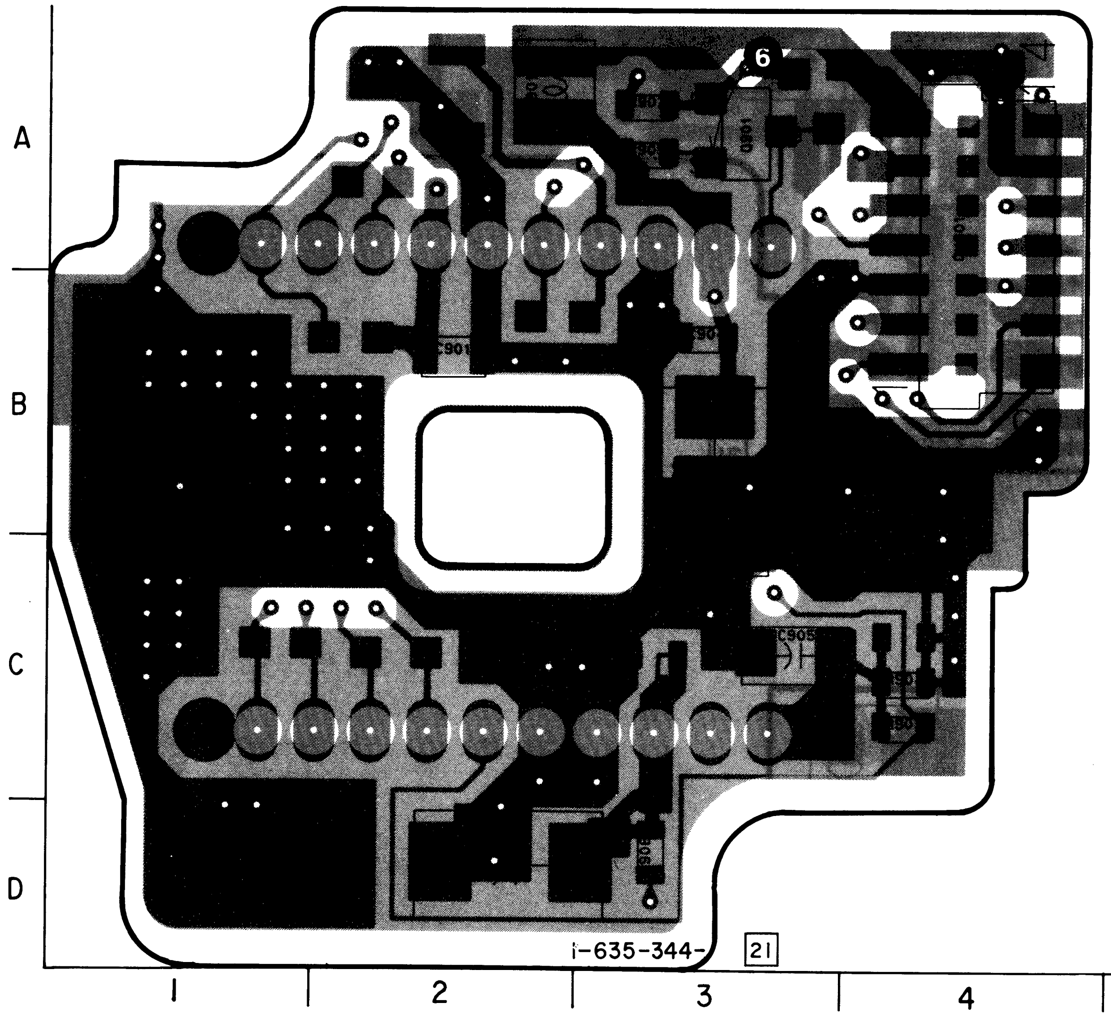
— Ref. No. CD-43 BOARD: 1000 series —

- **For printed wiring boards.**
- CD-43 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

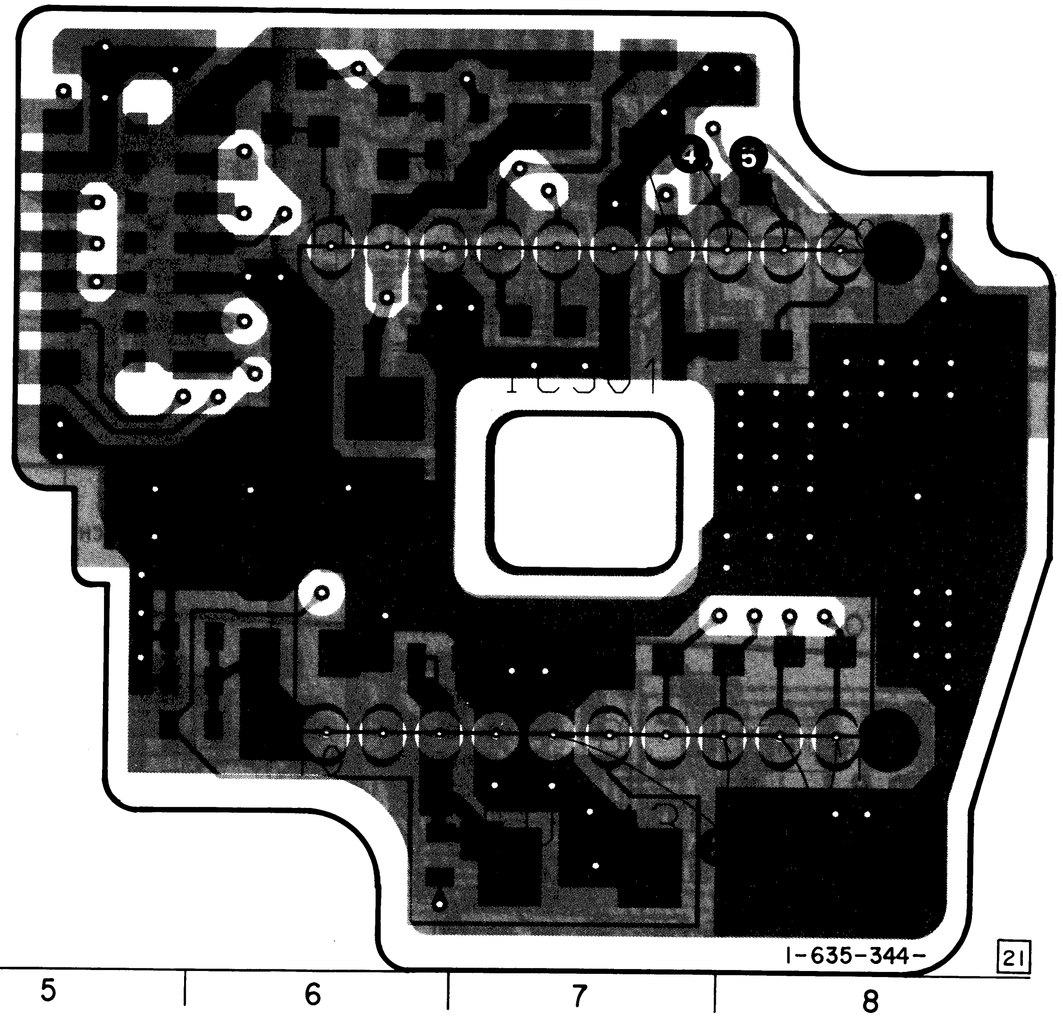
```
CD-43 BOARD
***********

                TRANSISTOR

Q901    8-765-420-02  TRANSISTOR 2SK300-3
```

CD-43 BOARD (COMPONENT SIDE)



A
B
C
D
1
2
3
4
6
Q901
C901
C905
C903
I-635-344-
21
09

CD-43 BOARD (CONDUCTOR SIDE)



IC901
4
5
5
6
7
8
I-635-344-
21

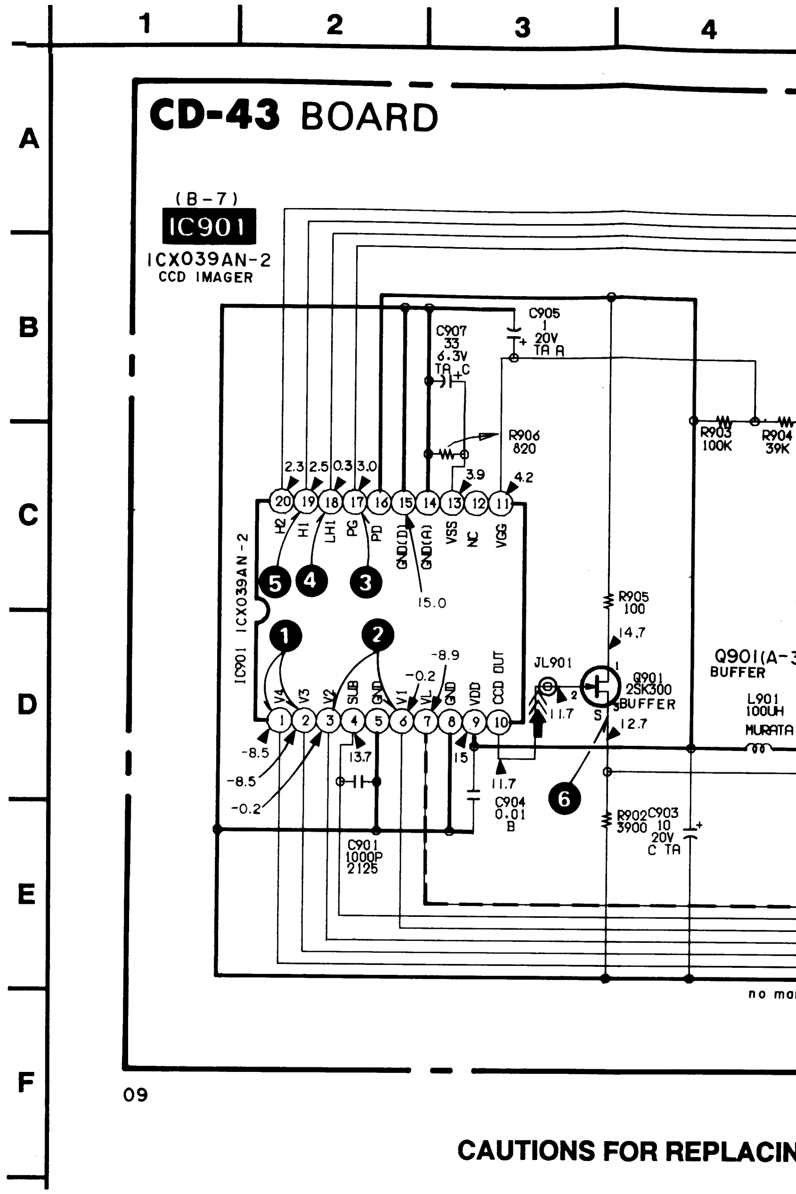
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡≫	
PB				

CD-43 (CCD IMAGER) SCHEMATIC DIAGRAMS

— Ref. No. CD-43 BOARD: 1000 series —

- **For schematic dia**
- The code shown like (position of location ad



1
2
3
4
A
B
C
D
E
F
CD-43 BOARD
(B-7)
IC901
ICX039AN-2
CCD IMAGER
IC901 ICX039AN-2
C905 1 20V TA A
C907 33 6.3V TA C
R906 820
R903 100K
R904 39K
2.3
2.5
0.3
3.0
3.9
4.2
H2
H1
LH1
PG
PD
GND(D)
GND(A)
VSS
NC
VGG
V4
V3
V2
SUB
GND
V1
VL
GND
VDD
CCD OUT
15.0
-8.9
-0.2
-8.5
-8.5
-0.2
13.7
15
11.7
11.7
14.7
12.7
R905 100
JL901
Q901 2SK300 BUFFER
Q901(A-3
BUFFER
L901 100UH MURATA
C904 0.01 B
C901 1000P 2125
R902 3900
C903 10 20V C TA
no ma
09

CAUTIONS FOR REPLACIN

- According to type of CCD ir board), it is necessary to req (IC001 on the DT-77J board).

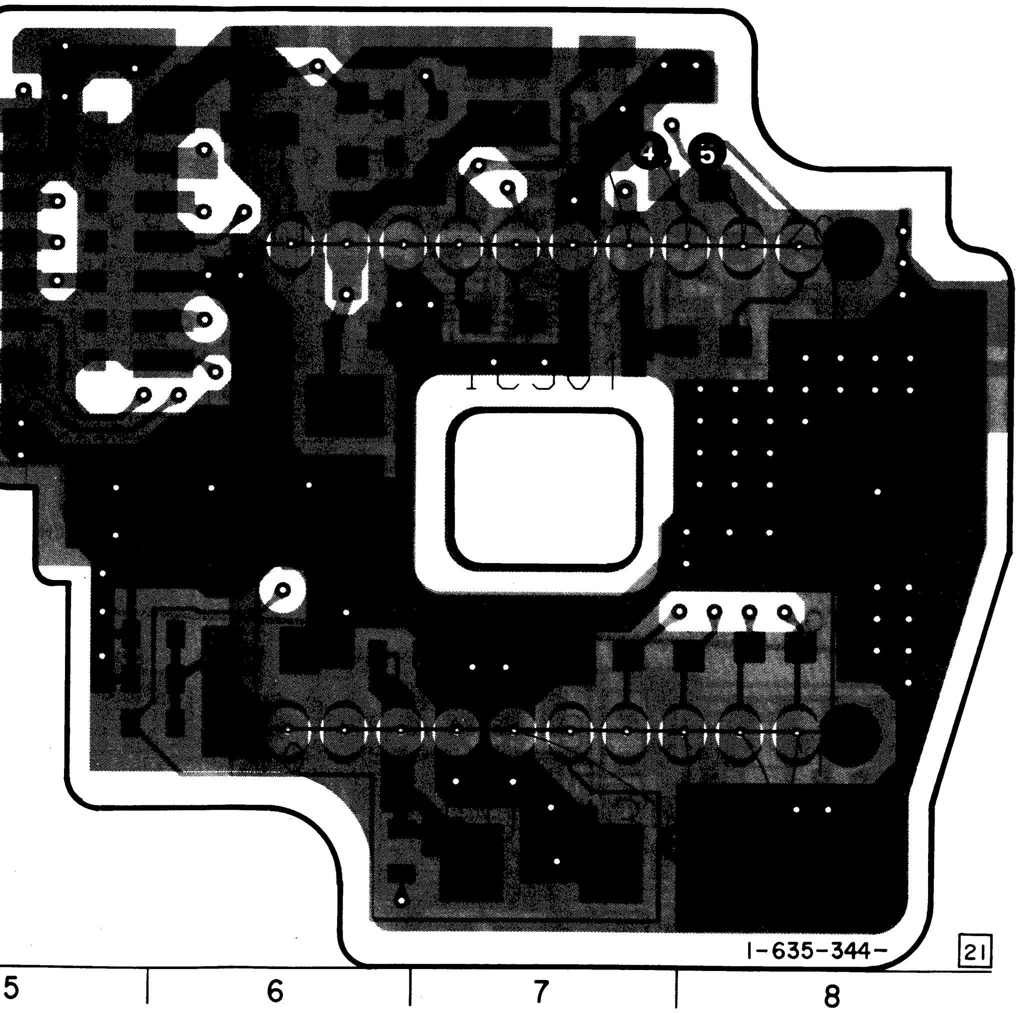
  The repairing CCD imager does ROM.

  So when replacing the CC compensating ROM is installe ROM before replacement.
- Since the mounted CD-43 an supplied asa repair parts are n respectively, replace the respe board to the new when replacing
- When you replaced the CCD camera head adjustment.
- CCD imager has such a structu static electricityy, so handle it wi Further, be sure that the light dust and no entry of bright light.

een from

from the

D-43 BOARD (CONDUCTOR SIDE)



IC901
1-635-344-
21
5
6
7
8

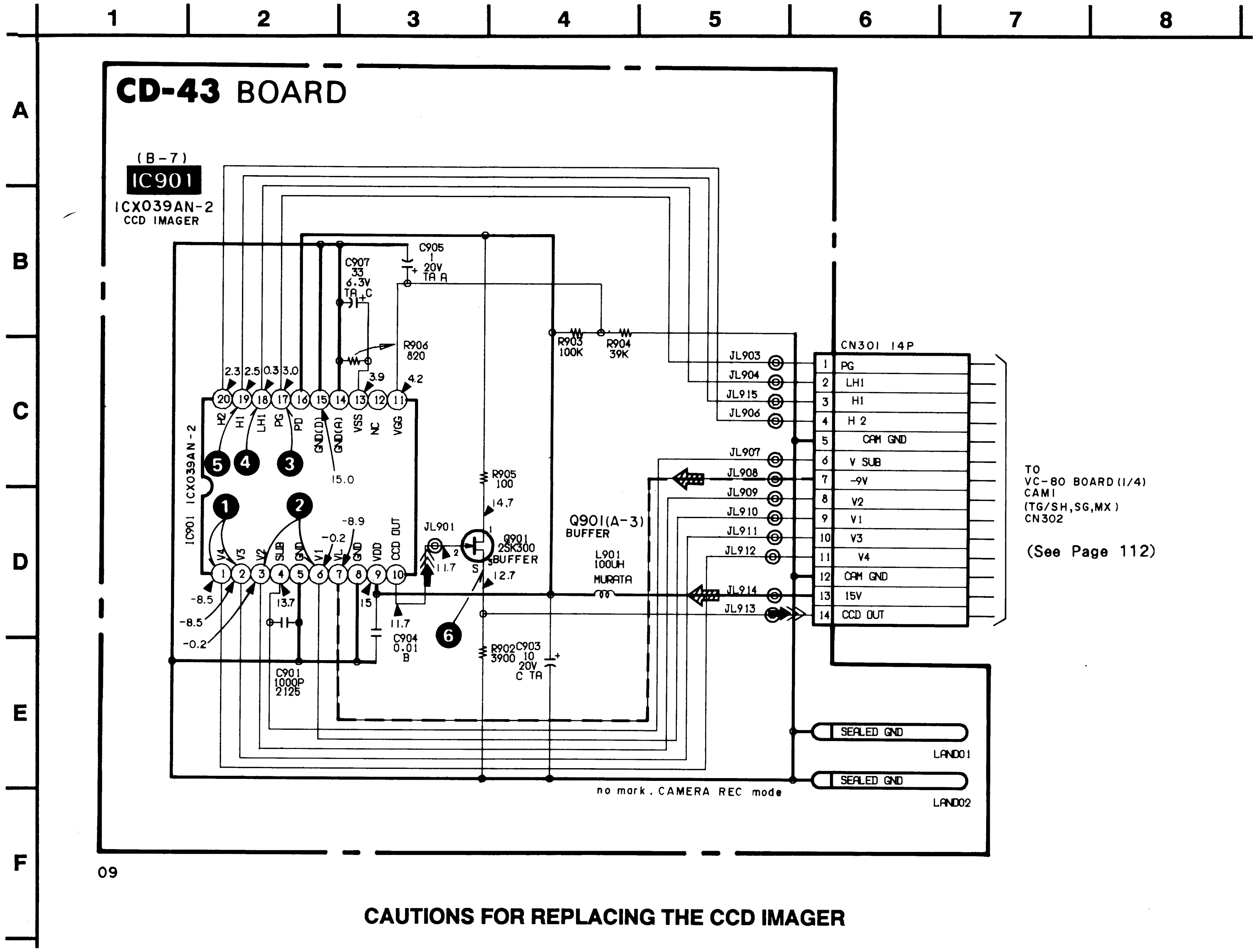
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡≫	
PB				

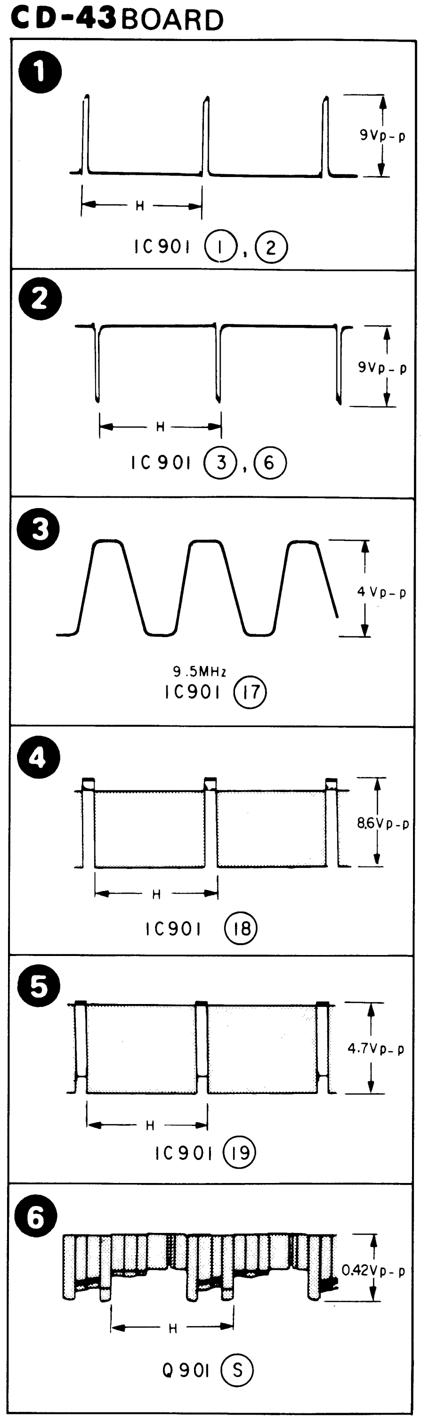
CD-43 (CCD IMAGER) SCHEMATIC DIAGRAMS

— Ref. No. CD-43 BOARD: 1000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.



1
2
3
4
5
6
7
8
A
B
C
D
E
F
CD-43 BOARD
(B-7)
IC901
ICX039AN-2
CCD IMAGER
IC901 ICX039AN-2
C907 33 6.3V TA C
C905 1 20V TA A
R906 820
2.3 2.5 0.3 3.0
3.9
4.2
H2 H1 LH1 PG PD GND(D) GND(A) VSS NC VGG
V4 V3 V2 SUB GND V1 GND VDD CCD OUT
15.0
-8.9
-0.2
-8.5
-8.5
-0.2
13.7
15
11.7
C904 0.01 B
C901 1000P 2125
R905 100
14.7
JL901
11.7
Q901 2SK300 BUFFER
12.7
Q901(A-3) BUFFER
L901 100UH MURATA
R902 3900
C903 10 20V C TA
R903 100K
R904 39K
JL903
JL904
JL915
JL906
JL907
JL908
JL909
JL910
JL911
JL912
JL914
JL913
CN301 14P
1 PG
2 LH1
3 H1
4 H2
5 CAM GND
6 V SUB
7 -9V
8 V2
9 V1
10 V3
11 V4
12 CAM GND
13 15V
14 CCD OUT
TO VC-80 BOARD (1/4) CAM1 (TG/SH,SG,MX) CN302
(See Page 112)
SEALED GND
LAND01
SEALED GND
LAND02
no mark. CAMERA REC mode
09



CAUTIONS FOR REPLACING THE CCD IMAGER

- According to type of CCD imager (IC901 on the CD-43 board), it is necessary to require the compensating ROM (IC001 on the DT-77J board).
  The repairing CCD imager does not require the compensating ROM.
  So when replacing the CCD imager on which the compensating ROM is installed, remove the compensating ROM before replacement.
- Since the mounted CD-43 and DT-77J boards ehich are supplied asa repair parts are not installed IC901 and IC001 respectively, replace the respective ICs from the previous board to the new when replacing each board.
- When you replaced the CCD imager, porform the overall camera head adjustment.
- CCD imager has such a structure that it may be spoiled by static electricityy, so handle it with a care similar for MOS IC. Further, be sure that the light receiving part has no stick of dust and no entry of bright light.

LD-33 BOARD
****

DIODE

D701	8-719-404-46	DIODE MA110

IC

IC701	8-759-037-20	IC MPC1737M
IC702	8-759-100-94	IC UPC358G2
IC703	8-759-981-82	IC RC3414M

TRANSISTOR

Q701	8-729-905-15	TRANSISTOR DTC144WU
Q702	8-729-920-39	TRANSISTOR IMT1US
Q703	8-729-905-61	TRANSISTOR DTC124EU
Q704	8-729-602-36	TRANSISTOR 2SA1602
Q706	8-729-805-25	TRANSISTOR 2SB1121
Q707	8-729-117-32	TRANSISTOR 2SC4177

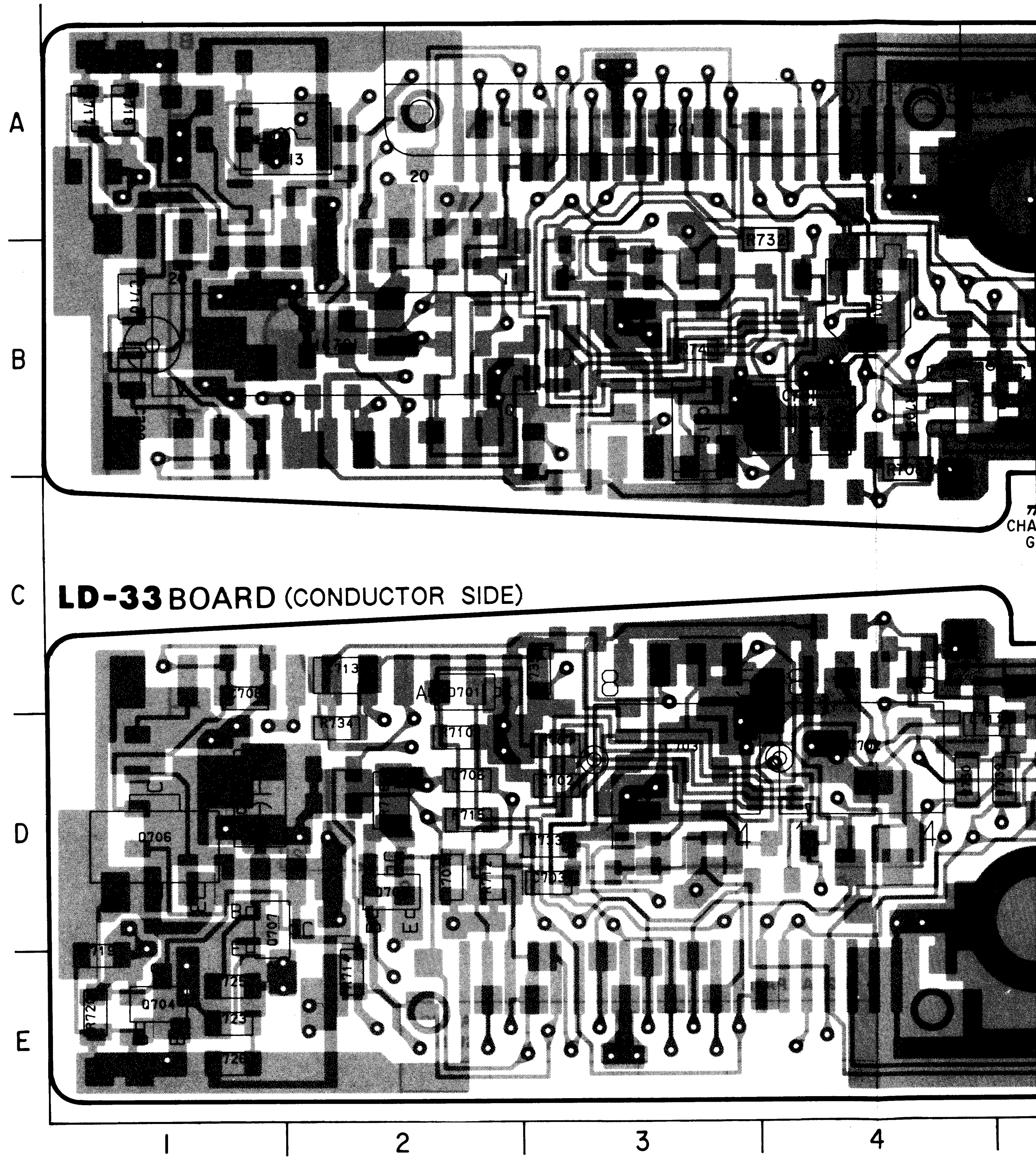
LD-33 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) PRINTED WIRING BOARDS

— Ref. No. LD-33 BOARD: 3000 series —

- **For printed wiring boards.**
- LD-33 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

LD-33 BOARD (COMPONENT SIDE)



LD-33 BOARD (CONDUCTOR SIDE)

09

LD-33 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) PRINTED WIRING BOARDS

— Ref. No. LD-33 BOARD: 3000 series —

- **For printed wiring boards.**
- LD-33 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

LD-33 BOARD
****

DIODE

D701	8-719-404-46	DIODE MA110

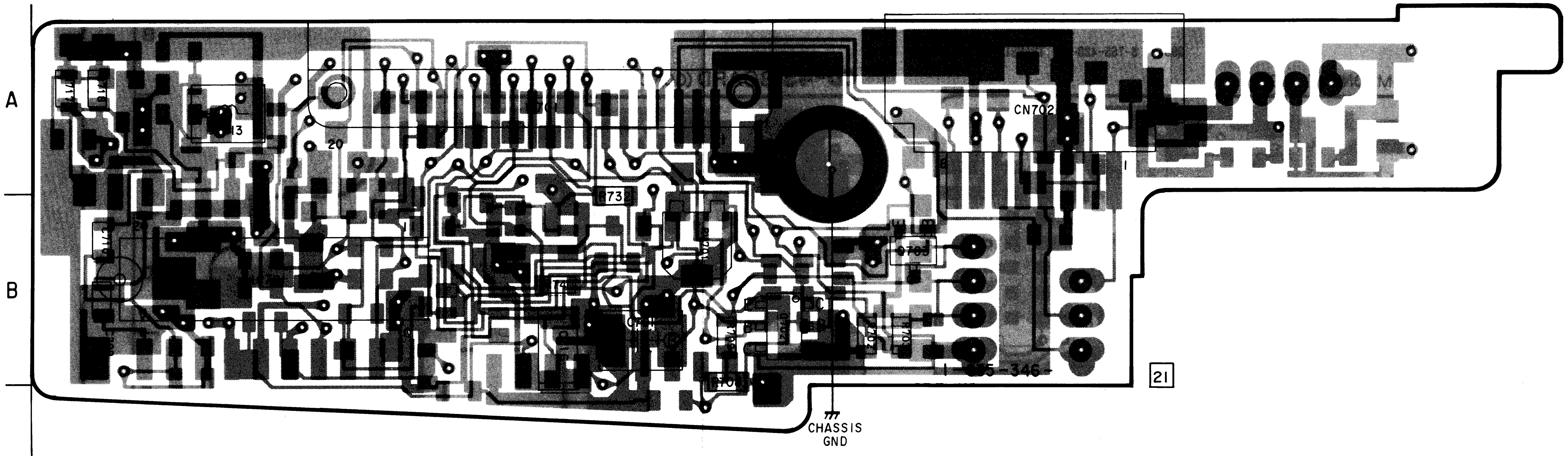
IC

IC701	8-759-037-20	IC MPC1737M
IC702	8-759-100-94	IC UPC358G2
IC703	8-759-981-82	IC RC3414M

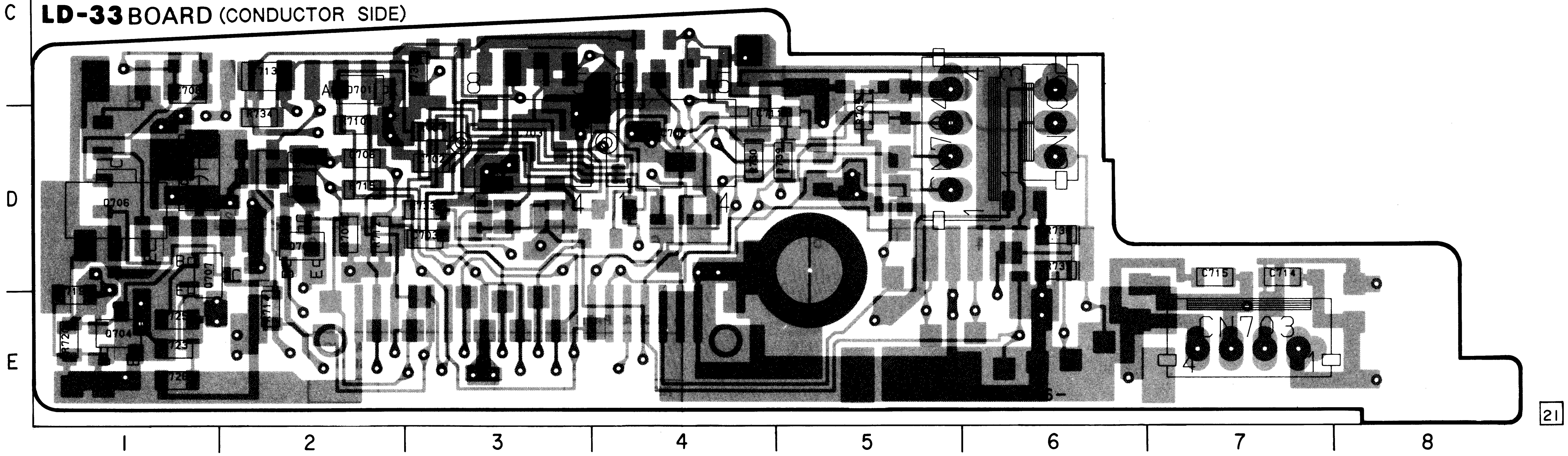
TRANSISTOR

Q701	8-729-905-15	TRANSISTOR DTC144WU
Q702	8-729-920-39	TRANSISTOR IMT1US
Q703	8-729-905-61	TRANSISTOR DTC124EU
Q704	8-729-602-36	TRANSISTOR 2SA1602
Q706	8-729-805-25	TRANSISTOR 2SB1121
Q707	8-729-117-32	TRANSISTOR 2SC4177

LD-33 BOARD (COMPONENT SIDE)



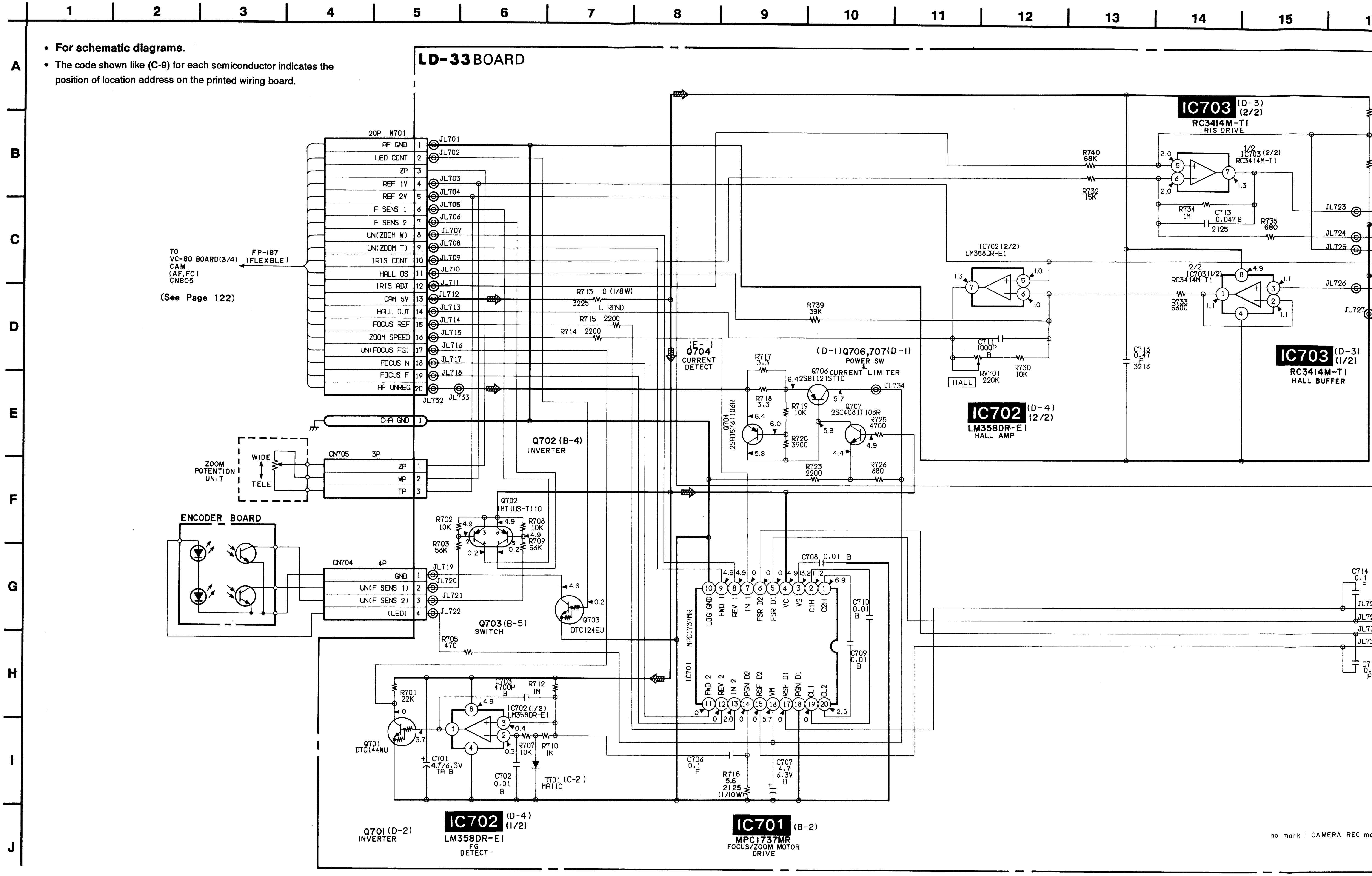
LD-33 BOARD (CONDUCTOR SIDE)



LD-33 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) SCHEMATIC DIAGRAMS

— Ref. No. LD-33 BOARD: 3000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.



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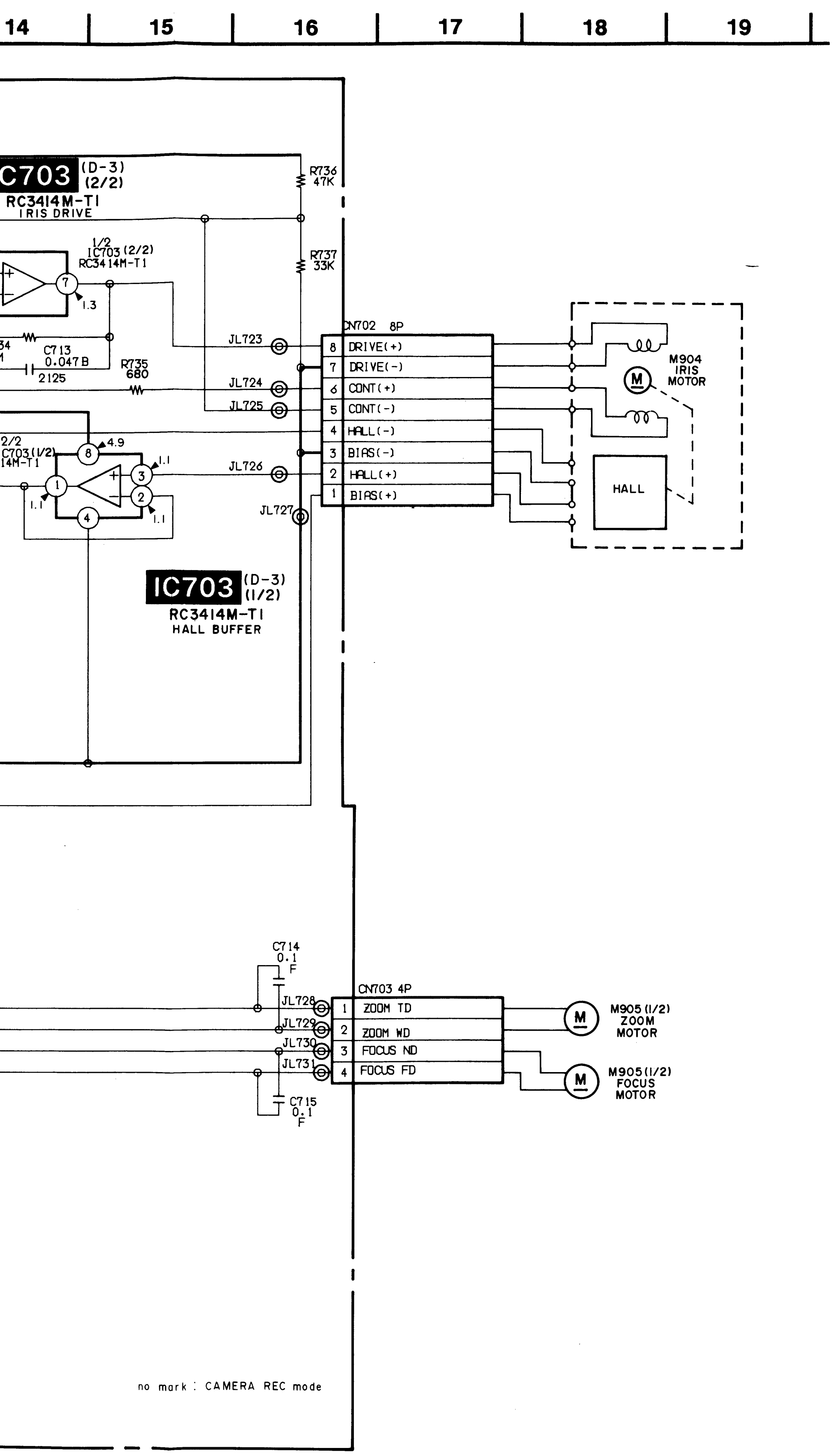
J
LD-33 BOARD
20P W701
AF GND
LED CONT
ZP
REF 1V
REF 2V
F SENS 1
F SENS 2
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
ZOOM SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
JL701
JL702
JL703
JL704
JL705
JL706
JL707
JL708
JL709
JL710
JL711
JL712
JL713
JL714
JL715
JL716
JL717
JL718
JL732
JL733
TO VC-80 BOARD(3/4) CAM1 (AF,FC) CN805
FP-187 (FLEXBLE)
(See Page 122)
CHA GND
ZOOM POTENTION UNIT
WIDE
TELE
CN705 3P
ZP
WP
TP
ENCODER BOARD
CN704 4P
GND
UN(F SENS 1)
UN(F SENS 2)
(LED)
JL719
JL720
JL721
JL722
R705 470
R713 0 (1/8W)
3225 L RAND
R715 2200
R714 2200
Q702 (B-4) INVERTER
Q702 IMT1US-T110
R702 10K
R703 56K
R708 10K
R709 56K
Q703 (B-5) SWITCH
Q703 DTC124EU
(E-1) Q704 CURRENT DETECT
Q704 2SA1576T106R
R717 3.3
R718 3.3
R719 10K
R720 3900
R723 2200
R726 680
R725 4700
(D-1)Q706,707(D-1) POWER SW & CURRENT LIMITER
Q706 2SB1121STTD
Q707 2SC4081T106R
JL734
R739 39K
R740 68K
R732 15K
R734 1M
C713 0.047 B 2125
R735 680
R733 5600
1/2 IC703(2/2) RC3414M-T1
2/2 IC703(1/2) RC3414M-T1
IC703 (D-3) (2/2) RC3414M-T1 IRIS DRIVE
IC703 (D-3) (1/2) RC3414M-T1 HALL BUFFER
IC702(2/2) LM358DR-E1
C711 1000P B
RV701 220K
R730 10K
HALL
IC702 (D-4) (2/2) LM358DR-E1 HALL AMP
C716 0.47 F 3216
JL723
JL724
JL725
JL726
JL727
C708 0.01 B
C710 0.01 B
C709 0.01 B
IC701 MPC1737MR
LOG GND
FWD 1
REV 1
IN 1
FSR D2
FSR D1
VC
VG
C1H
C2H
FWD 2
REV 2
IN 2
PGN D2
RSF D2
VM
RSF D1
PGN D1
CL1
CL2
C706 0.1 F
R716 5.6 2125 (1/10W)
C707 4.7 6.3V A
R701 22K
Q701 DTC144WU
C701 4.7/6.3V TA B
C703 4700P B
R712 1M
IC702(1/2) LM358DR-E1
R707 10K
R710 1K
C702 0.01 B
D701 (C-2) MA110
Q701 (D-2) INVERTER
IC702 (D-4) (1/2) LM358DR-E1 FG DETECT
IC701 (B-2) MPC1737MR FOCUS/ZOOM MOTOR DRIVE
C714 0.1 F
no mark : CAMERA REC mo

09


14
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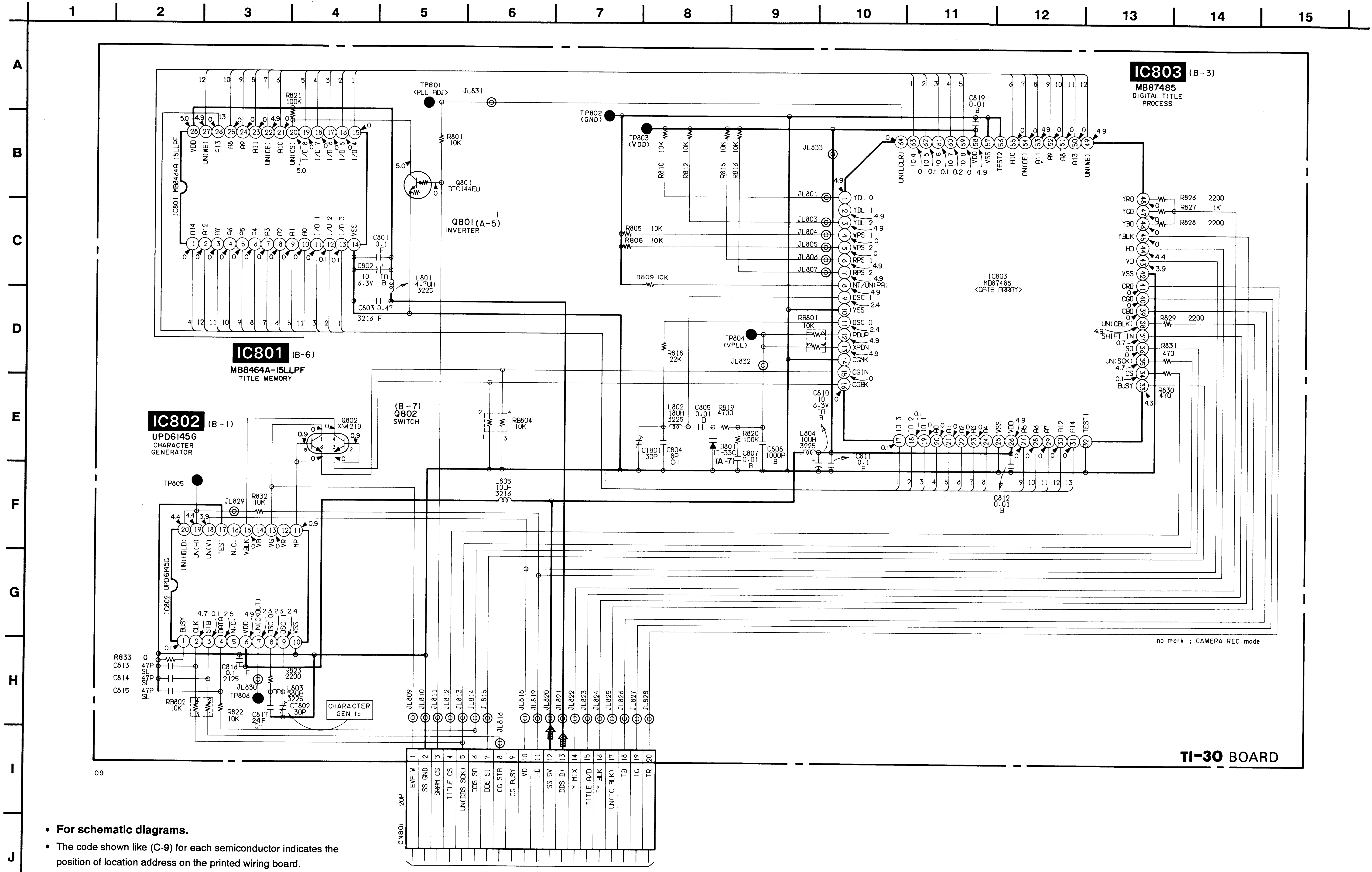
19
C703 (D-3) (2/2)
RC3414M-T1
IRIS DRIVE
R736 47K
R737 33K
1/2 IC703 (2/2) RC3414M-T1
7
1.3
34
M
C713 0.047B
2125
R735 680
JL723
JL724
JL725
JL726
JL727
CN702 8P
8 DRIVE(+)
7 DRIVE(-)
6 CONT(+)
5 CONT(-)
4 HALL(-)
3 BIAS(-)
2 HALL(+)
1 BIAS(+)
M
M904 IRIS MOTOR
HALL
2/2
C703(1/2)
14M-T1
8
4.9
1
1.1
3
1.1
2
1.1
4
IC703 (D-3) (1/2)
RC3414M-T1
HALL BUFFER
C714 0.1 F
C715 0.1 F
JL728
JL729
JL730
JL731
CN703 4P
1 ZOOM TD
2 ZOOM WD
3 FOCUS ND
4 FOCUS FD
M
M905 (1/2) ZOOM MOTOR
M
M905 (1/2) FOCUS MOTOR
no mark : CAMERA REC mode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J
IC801 (B-6)
MB8464A-15LLPF
TITLE MEMORY
IC801 MB8464A-15LLPF
IC802 (B-1)
UPD6145G
CHARACTER GENERATOR
IC802 UPD6145G
IC803 (B-3)
MB87485
DIGITAL TITLE PROCESS
IC803 MB87485 <GATE ARRAY>
Q801 (A-5)
INVERTER
Q801 DTC144EU
(B-7) Q802 SWITCH
Q802 XN4210
TP801 <PLL ADJ>
TP802 (GND)
TP803 (VDD)
TP804 (VPLL)
TP805
TP806
JL831
JL833
JL832
JL829
JL830
R821 100K
R801 10K
R810 10K
R812 10K
R815 10K
R816 10K
R805 10K
R806 10K
R809 10K
RB801 10K
R818 22K
L802 18UH 3225
C805 0.01 B
R819 4700
R820 100K
D801 1T-33C (A-7)
C807 0.01 B
C808 1000P B
CT801 30P
C804 8P CH
C810 10 6.3V TA B
L804 10UH 3225
C811 0.1 F
C812 0.01 B
C819 0.01 B
RB804 10K
L805 10UH 3216
C801 0.1 F
C802 10 6.3V TA B
L801 4.7UH 3225
C803 0.47 3216 F
R826 2200
R827 1K
R828 2200
R829 2200
R831 470
R830 470
R832 10K
R833 0
C813 47P SL
C814 47P SL
C815 47P SL
RB802 10K
R822 10K
C816 0.1 2125
R823 2200
L803 39UH 3225
CT802 30P
C817 24P CH
CHARACTER GEN fo
JL801
JL803
JL804
JL805
JL806
JL807
JL809
JL810
JL811
JL812
JL813
JL814
JL815
JL816
JL818
JL819
JL820
JL821
JL822
JL823
JL824
JL825
JL826
JL827
JL828
CN801 20P
EVF W
SS GND
SRAM CS
TITLE CS
UN(DDS SCK)
DDS SO
DDS SI
CG STB
CG BUSY
VD
HD
SS 5V
DDS B+
TY MIX
TITLE A/D
TY BLK
UN(TC BLK)
TB
TG
TR
TO VC-80 BOARD (3/4) CAM3 (AF,FC) CN803
(See Page 120)
no mark : CAMERA REC mode
TI-30 BOARD
09

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

PD-18 (CHROMA NOISE REDUCTION) PRINTED WIRING BOARDS

— Ref. No. PD-18 BOARD: 4000 series —

- **For printed wiring boards.**
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

PD-18 BOARD
****

DIODE

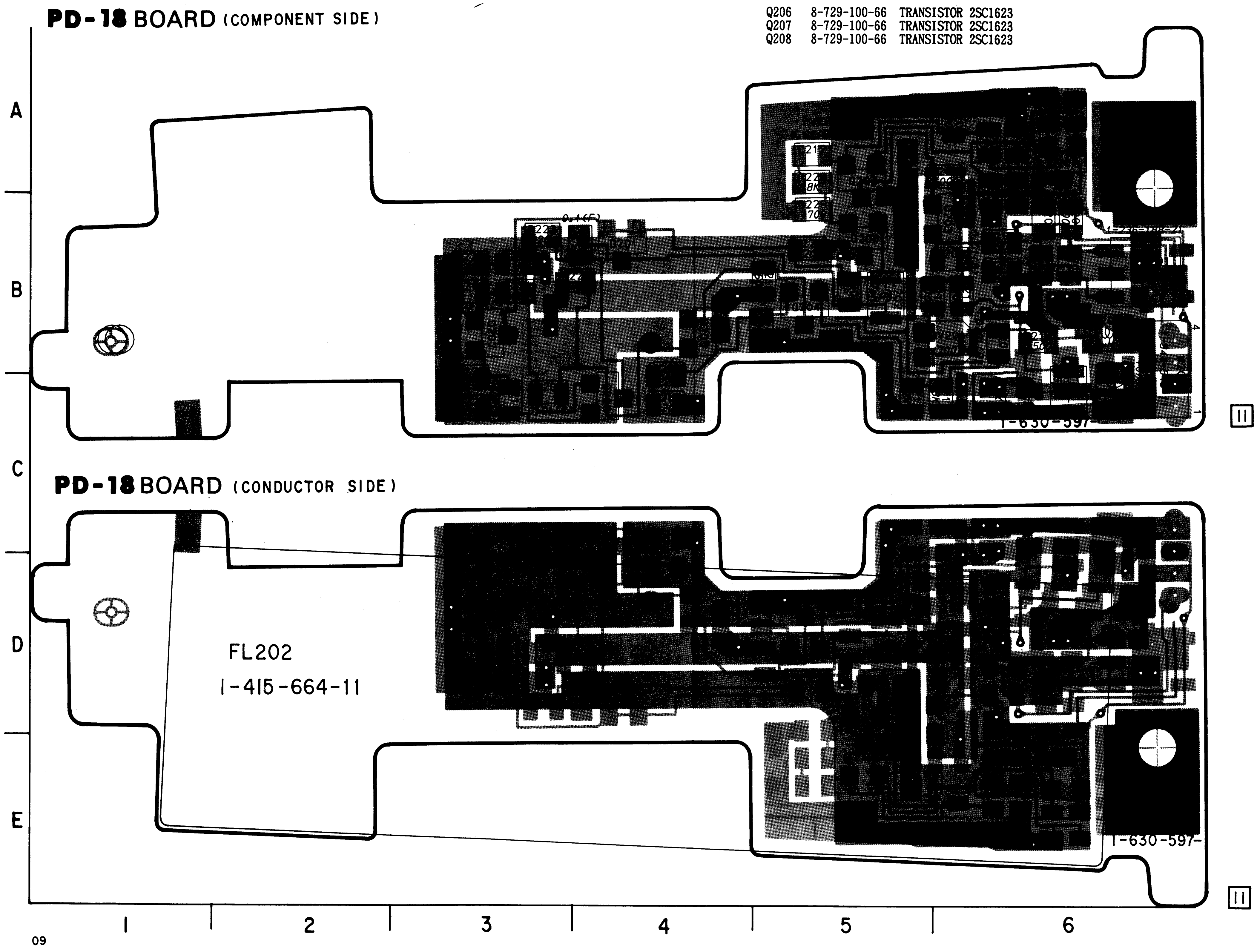
D201	8-719-800-76	DIODE 1SS226

TRANSISTOR

Q201	8-729-100-66	TRANSISTOR 2SC1623
Q202	8-729-100-66	TRANSISTOR 2SC1623
Q203	8-729-100-66	TRANSISTOR 2SC1623
Q204	8-729-100-66	TRANSISTOR 2SC1623
Q205	8-729-100-66	TRANSISTOR 2SC1623
Q206	8-729-100-66	TRANSISTOR 2SC1623
Q207	8-729-100-66	TRANSISTOR 2SC1623
Q208	8-729-100-66	TRANSISTOR 2SC1623

PD-18 BOARD (COMPONENT SIDE)

PD-18 BOARD (CONDUCTOR SIDE)



PD-18 (CHROMA NOIS

— Ref. No. PD-18 BOARD: 4000

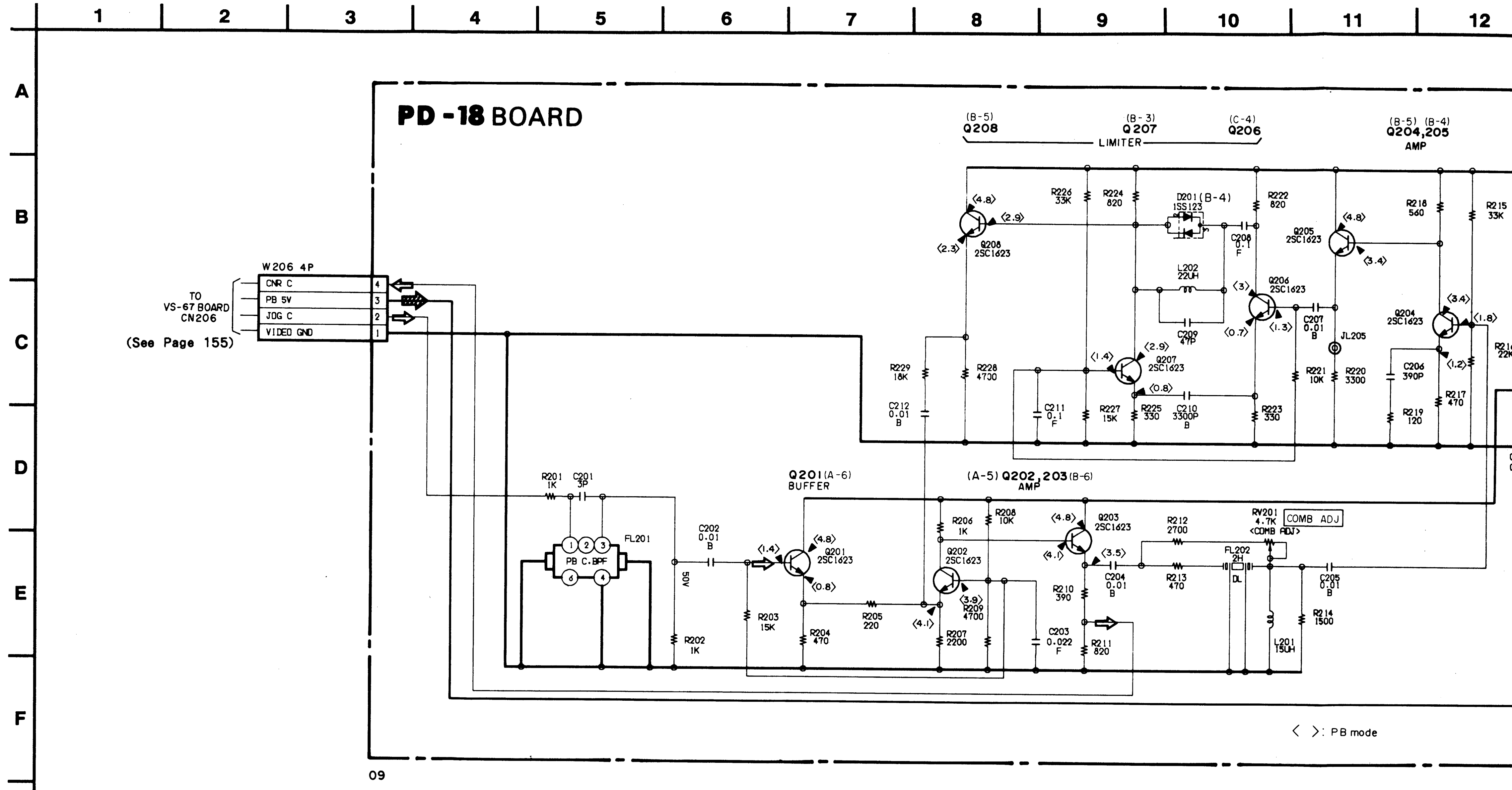
- **For schematic diagram**
- Chip resistor are 1/10W unle
- **For schematic diagram**
- The code shown like (C-9) fo position of location address

PD-18 (CHROMA NOISE REDUCTION) SCHEMATIC DIAGRAMS

— Ref. No. PD-18 BOARD: 4000 series —

- **For schematic diagrams.**
- Chip resistor are 1/10W unless otherwise noted.

- **For schematic diagrams.** /
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.



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PD -18 BOARD
(B-5) Q208
(B-3) Q207
(C-4) Q206
LIMITER
(B-5) (B-4) Q204,205 AMP
W206 4P
CNR C
PB 5V
JOG C
VIDEO GND
TO VS-67 BOARD CN206
(See Page 155)
Q201 (A-6) BUFFER
(A-5) Q202,203 (B-6) AMP
R201 1K
C201 3P
FL201
PB C.BPF
C202 0.01 B
50V
R202 1K
R203 15K
R204 470
R205 220
Q201 2SC1623
R206 1K
R208 10K
Q202 2SC1623
R209 4700
R207 2200
Q203 2SC1623
R210 390
C203 0.022 F
R211 820
C204 0.01 B
R212 2700
R213 470
RV201 4.7K <COMB ADJ>
COMB ADJ
FL202 2H DL
L201 15UH
C205 0.01 B
R214 1500
Q208 2SC1623
R226 33K
R224 820
D201 (B-4) 1SS123
R222 820
C208 0.1 F
L202 22UH
C209 47P
Q206 2SC1623
Q207 2SC1623
R229 18K
C212 0.01 B
R228 4730
C211 0.1 F
R227 15K
R225 330
C210 3300P B
R223 330
C207 0.01 B
R221 10K
JL205
R220 3300
Q205 2SC1623
Q204 2SC1623
R218 560
R215 33K
C206 390P
R219 120
R217 470
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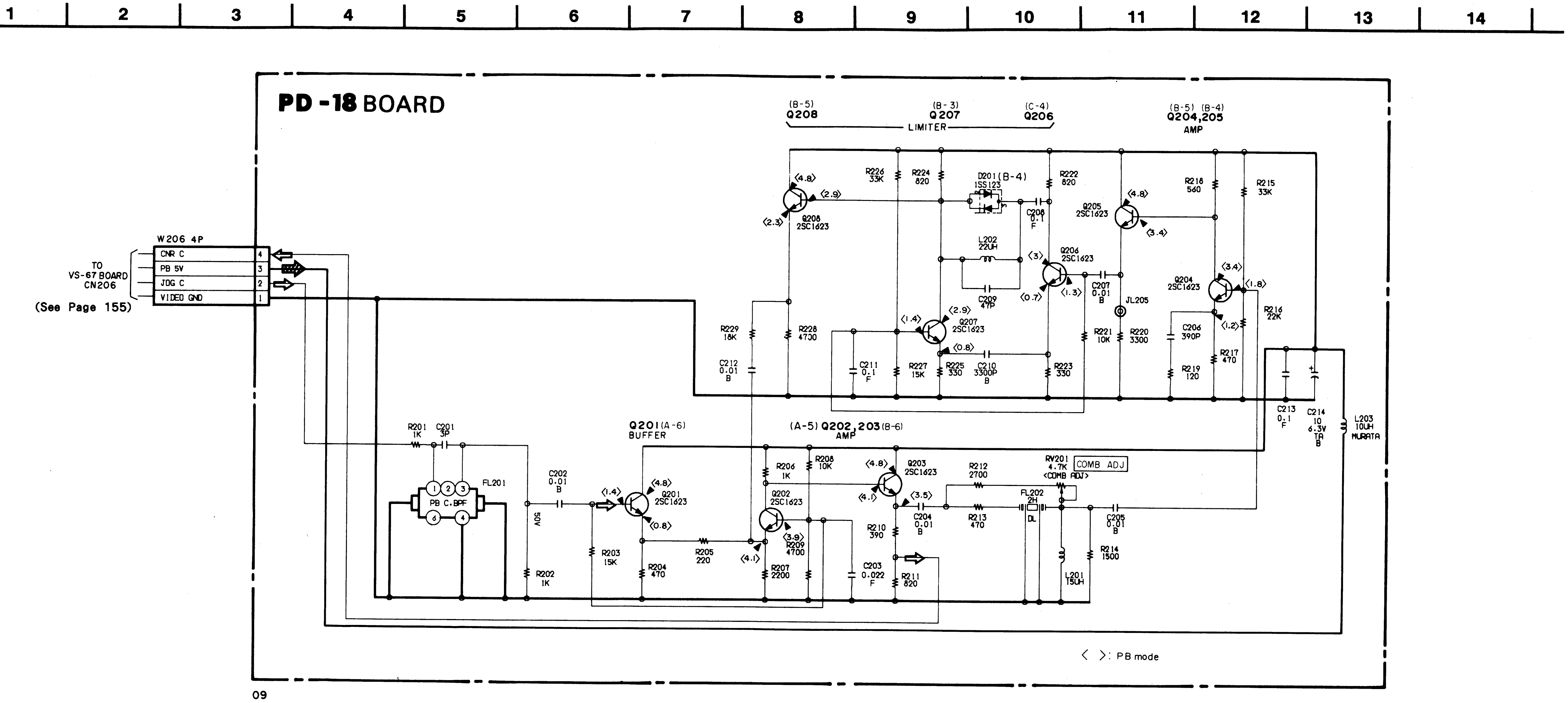
< >: PB mode

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				
PB	⇨			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PD -18 BOARD
(B-5) Q208
(B-3) Q207
(C-4) Q206
LIMITER
(B-5) (B-4) Q204,205
AMP
W206 4P
CNR C
PB 5V
JOG C
VIDEO GND
TO VS-67 BOARD CN206
(See Page 155)
Q208 2SC1623
R226 33K
R224 820
D201 (B-4) 1SS123
R222 820
C208 0.1 F
L202 22UH
C209 47P
Q206 2SC1623
C207 0.01 B
JL205
Q205 2SC1623
R218 560
R215 33K
Q204 2SC1623
R216 22K
R217 470
R219 120
C206 390P
R220 3300
R221 10K
R223 330
Q207 2SC1623
R225 330
C210 3300P B
R227 15K
C211 0.1 F
R228 4700
R229 18K
C212 0.01 B
C213 0.1 F
C214 10 6.3V TA B
L203 10UH MURATA
Q201 (A-6) BUFFER
(A-5) Q202, 203 (B-6) AMP
R201 1K
C201 3P
FL201
PB C.BPF
C202 0.01 B
50V
R202 1K
Q201 2SC1623
R203 15K
R204 470
R205 220
Q202 2SC1623
R206 1K
R208 10K
R207 2200
R209 4700
Q203 2SC1623
R210 390
C203 0.022 F
R211 820
C204 0.01 B
R212 2700
R213 470
RV201 4.7K <COMB ADJ>
COMB ADJ
FL202 2H
DL
L201 15UH
R214 1500
C205 0.01 B
<4.8>
<2.9>
<2.3>
<3>
<0.7>
<1.3>
<1.4>
<0.8>
<3.4>
<1.8>
<1.2>
<4.1>
<3.5>
<3.9>
< >: PB mode
09

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				
PB	⇨			

VS-67 (HEAD AMP/VIDEO/SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

— Ref. No. VS-67 BOARD: 5000 series —

- **For printed wiring boards.**
- VS-67 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VS-67 BOARD
****

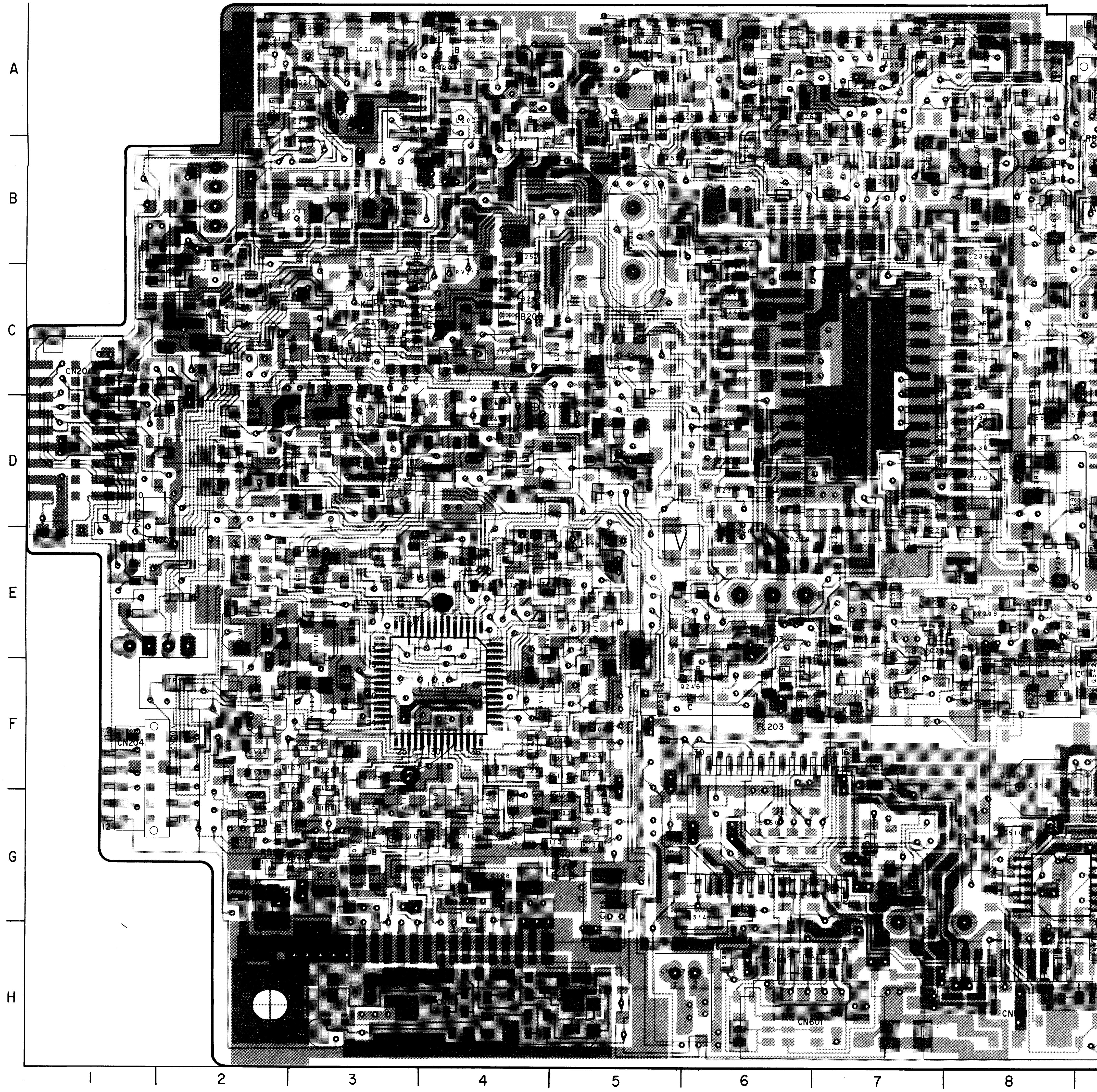
DIODE

D201	8-719-404-46	DIODE MA110
D211	8-719-118-21	DIODE 1SS283
D213	8-719-404-35	DIODE MA141WK
D214	8-719-404-35	DIODE MA141WK
D215	8-719-800-76	DIODE 1SS226
D216	8-719-404-46	DIODE MA110
D217	8-719-404-46	DIODE MA110
D218	8-719-404-46	DIODE MA110
D601	8-719-404-40	DIODE MA121
D602	8-719-404-40	DIODE MA121
D603	8-719-404-40	DIODE MA121
D604	8-719-404-40	DIODE MA121
D605	8-719-404-46	DIODE MA110
D606	8-719-404-46	DIODE MA110
D681	8-719-404-46	DIODE MA110

IC

IC101	8-752-033-38	IC CXA1202R
IC102	8-752-033-38	IC CXA1202R
IC201	8-752-033-40	IC CXA1201Q
IC202	8-752-324-87	IC CXL1502M
IC203	8-752-034-40	IC CXA1200BQ
IC204	8-759-605-61	IC CXA1203N
IC205	8-759-009-22	IC MC14094BF
IC501	8-759-506-96	IC CXA8006M-Q
IC502	8-759-150-12	IC CXA8010N
IC504	8-752-038-71	IC CXA1127AM
IC505	8-752-035-48	IC CXA1204Q
IC601	8-752-816-62	IC CXP80116-69C
IC602	8-759-990-78	IC S-81350AG-RE
IC603	8-759-987-66	IC TL7757CPK
IC604	8-759-150-05	IC UPC324G2
IC605	8-759-030-64	IC MPC1710AM
IC607	8-759-100-93	IC UPC393G2

VS-67 BOARD (COMPONENT SIDE)



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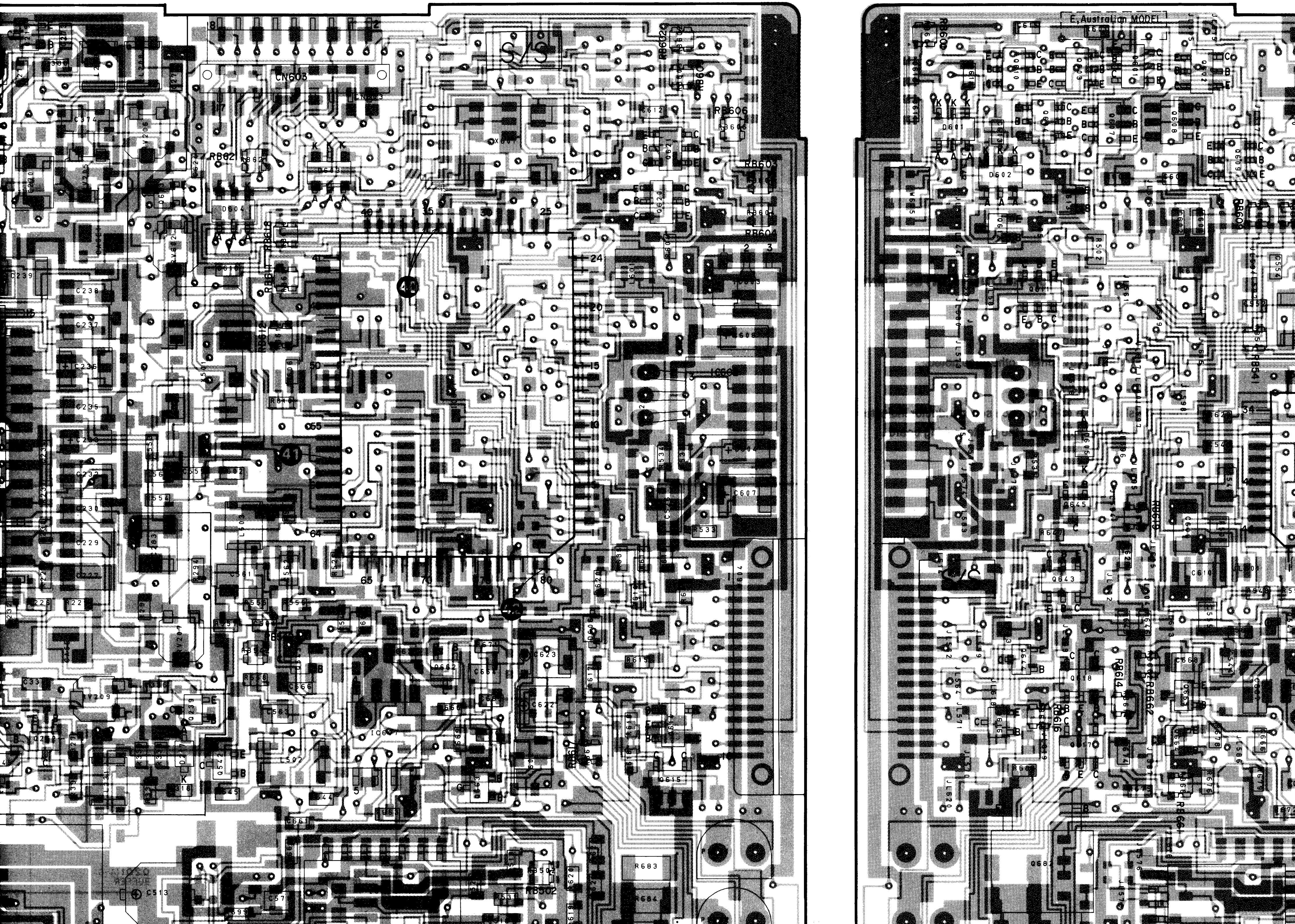
IC

IC101	8-752-033-38	IC CXA1202R
IC102	8-752-033-38	IC CXA1202R
IC201	8-752-033-40	IC CXA1201Q
IC202	8-752-324-87	IC CXL1502M
IC203	8-752-034-40	IC CXA1200BQ
IC204	8-759-605-61	IC CXA1203N
IC205	8-759-009-22	IC MC14094BF
IC501	8-759-506-96	IC CXA8006M-Q
IC502	8-759-150-12	IC CXA8010N
IC504	8-752-038-71	IC CXA1127AM
IC505	8-752-035-48	IC CXA1204Q
IC601	8-752-816-62	IC CXP80116-690Q
IC602	8-759-990-78	IC S-81350AG-REG
IC603	8-759-987-66	IC TL7757CPK
IC604	8-759-150-05	IC UPC324G2
IC605	8-759-030-64	IC MPC1710AM
IC607	8-759-100-93	IC UPC393G2

TRANSISTOR

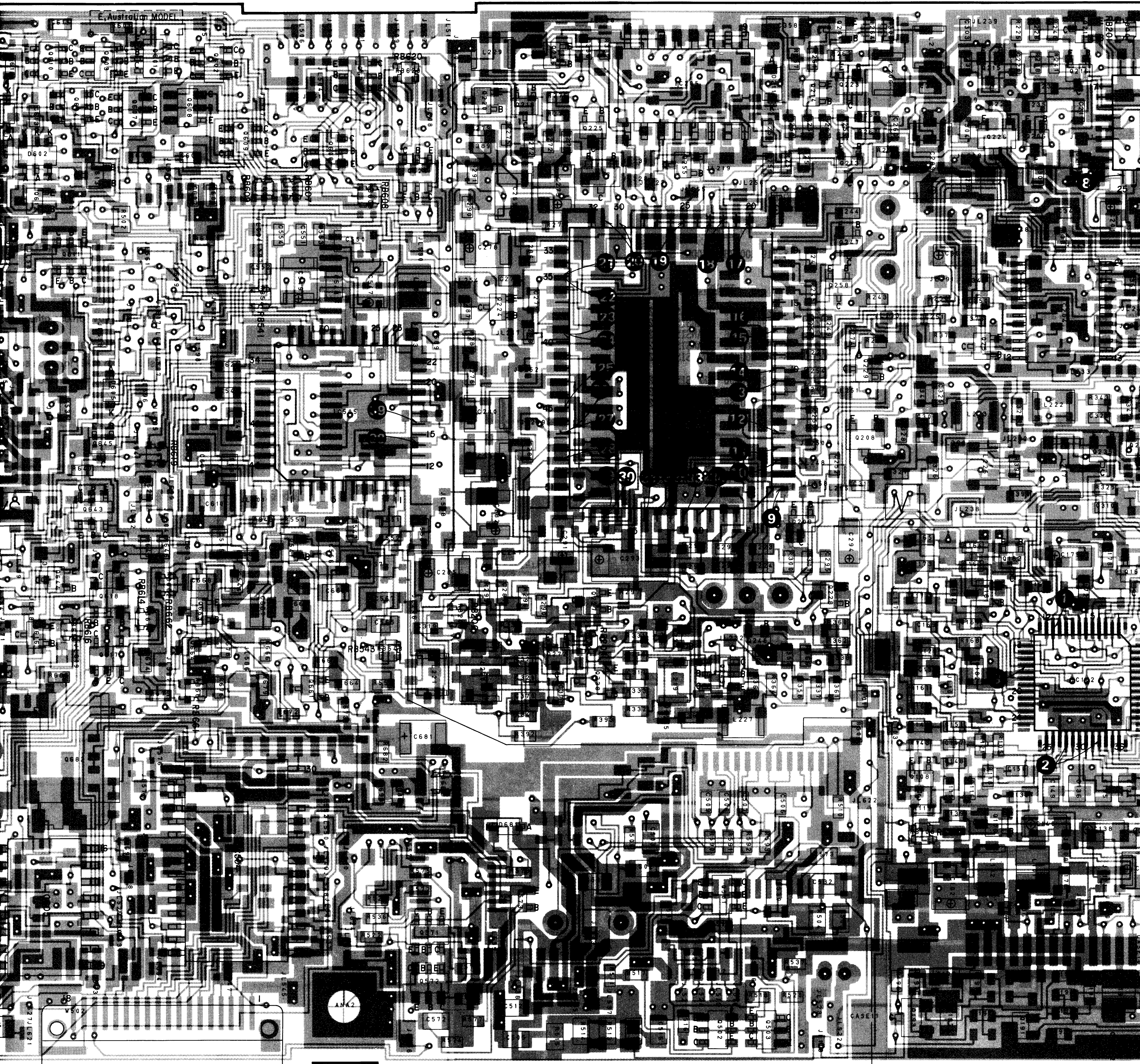
Q101	8-729-209-07	TRANSISTOR 2SC4213B
Q102	8-729-209-07	TRANSISTOR 2SC4213B
Q103	8-729-117-16	TRANSISTOR 2SA1611-M6
Q104	8-729-117-16	TRANSISTOR 2SA1611-M6
Q105	8-729-209-07	TRANSISTOR 2SC4213B
Q106	8-729-209-07	TRANSISTOR 2SC4213B
Q107	8-729-117-16	TRANSISTOR 2SA1611-M6
Q108	8-729-117-16	TRANSISTOR 2SA1611-M6
Q109	8-729-402-42	TRANSISTOR UN5213
Q161	8-729-403-35	TRANSISTOR UN5113
Q162	8-729-117-32	TRANSISTOR 2SC4177
Q164	8-729-402-42	TRANSISTOR UN5213
Q165	8-729-402-42	TRANSISTOR UN5213
Q166	8-729-402-42	TRANSISTOR UN5213
Q167	8-729-402-42	TRANSISTOR UN5213
Q191	8-729-117-16	TRANSISTOR 2SA1611-M6
Q193	8-729-216-22	TRANSISTOR 2SA1162
Q201	8-729-101-07	TRANSISTOR 2SB798-DL
Q202	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q203	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q204	8-729-402-42	TRANSISTOR UN5213
Q205	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q206	8-729-907-00	TRANSISTOR DTC114EU
Q207	8-729-140-88	TRANSISTOR FP1A3M
Q208	8-729-102-07	TRANSISTOR 2SC2223-F13
Q209	8-729-402-42	TRANSISTOR UN5213
Q211	8-729-905-61	TRANSISTOR DTC124EU
Q212	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q213	8-729-117-32	TRANSISTOR 2SC4177
Q214	8-729-117-32	TRANSISTOR 2SC4177
Q215	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q216	8-729-117-32	TRANSISTOR 2SC4177
Q217	8-729-102-07	TRANSISTOR 2SC2223F-13
Q218	8-729-117-32	TRANSISTOR 2SC4177
Q219	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q220	8-729-117-32	TRANSISTOR 2SC4177
Q222	8-729-117-32	TRANSISTOR 2SC4177
Q223	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q224	8-729-403-35	TRANSISTOR UN5113
Q225	8-729-117-32	TRANSISTOR 2SC4177
Q226	8-729-807-87	TRANSISTOR 2SB1295-UL6
Q227	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q228	8-729-117-32	TRANSISTOR 2SC4177
Q229	8-729-905-15	TRANSISTOR DTC144WU
Q230	8-729-117-32	TRANSISTOR 2SC4177
Q231	8-729-905-15	TRANSISTOR DTC144WU
Q232	8-729-140-88	TRANSISTOR FP1A3M
Q233	8-729-117-32	TRANSISTOR 2SC4177
Q234	8-729-117-32	TRANSISTOR 2SC4177
Q235	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q236	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q237	8-729-117-16	TRANSISTOR 2SA1611-M6
Q238	8-729-102-07	TRANSISTOR 2SC2223-F13
Q239	8-729-117-32	TRANSISTOR 2SC4177
Q241	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q242	8-729-402-	
Q243	8-729-403-	
Q244	8-729-420-	
Q245	8-729-102-	
Q246	8-729-117-	
Q247	8-729-117-	
Q248	8-729-403-	
Q249	8-729-420-	
Q250	8-729-403-	
Q251	8-729-402-	
Q252	8-729-117-	
Q253	8-729-117-	
Q254	8-729-403-	
Q255	8-729-921-	
Q256	8-729-402-	
Q258	8-729-921-	
Q259	8-729-921-	
Q260	8-729-117-	
Q261	8-729-140-	
Q270	8-729-140-	

VS-67 BOARD (CONDUCTOR SIDE)



	7	TRANSISTOR 2SB1295-UL6
	3	TRANSISTOR 2SA1611-M5M6
	2	TRANSISTOR 2SC4177
	5	TRANSISTOR DTC144WU
	2	TRANSISTOR 2SC4177
	5	TRANSISTOR DTC144WU
	3	TRANSISTOR FP1A3M
	2	TRANSISTOR 2SC4177
	2	TRANSISTOR 2SC4177
	3	TRANSISTOR 2SA1611-M5M6
	3	TRANSISTOR 2SA1611-M5M6
	6	TRANSISTOR 2SA1611-M6
	7	TRANSISTOR 2SC2223-F13
	2	TRANSISTOR 2SC4177
	3	TRANSISTOR 2SA1611-M5M6
Q242	8-729-402-42	TRANSISTOR UN5213
Q243	8-729-403-35	TRANSISTOR UN5113
Q244	8-729-420-12	TRANSISTOR XN4213
Q245	8-729-102-07	TRANSISTOR 2SC2223-F13
Q246	8-729-117-32	TRANSISTOR 2SC4177
Q247	8-729-117-32	TRANSISTOR 2SC4177
Q248	8-729-403-35	TRANSISTOR UN5113
Q249	8-729-420-12	TRANSISTOR XN4213
Q250	8-729-403-35	TRANSISTOR UN5113
Q251	8-729-402-42	TRANSISTOR UN5213
Q252	8-729-117-32	TRANSISTOR 2SC4177
Q253	8-729-117-32	TRANSISTOR 2SC4177
Q254	8-729-403-35	TRANSISTOR UN5113
Q255	8-729-921-08	TRANSISTOR DTC144TU
Q256	8-729-402-42	TRANSISTOR UN5213
Q258	8-729-921-08	TRANSISTOR DTC144TU
Q259	8-729-921-58	TRANSISTOR DTA144TU
Q260	8-729-117-32	TRANSISTOR 2SC4177
Q261	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q270	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q272	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q275	8-729-402-42	TRANSISTOR UN5213
Q276	8-729-403-35	TRANSISTOR UN5113
Q501	8-729-403-27	TRANSISTOR XN4401
Q502	8-729-822-94	TRANSISTOR FC102
Q503	8-729-822-94	TRANSISTOR FC102
Q541	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q542	8-729-117-32	TRANSISTOR 2SC4177
Q543	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q571	8-729-403-27	TRANSISTOR XN4401
Q572	8-729-403-27	TRANSISTOR XN4401
Q573	8-729-117-32	TRANSISTOR 2SC4177
Q601	8-729-403-24	TRANSISTOR XN4210
Q602	8-729-403-24	TRANSISTOR XN4210
Q603	8-729-403-24	TRANSISTOR XN4210
Q604	8-729-403-24	TRANSISTOR XN4210
Q606	8-729-403-24	TRANSISTOR XN4210
Q607	8-729-403-24	TRANSISTOR XN4210
Q608	8-729-403-24	TRANSISTOR XN4210
Q609	8-729-403-24	TRANSISTOR XN4210
Q610	8-729-403-24	TRANSISTOR XN4210
Q611	8-729-420-12	TRANSISTOR XN4213
Q612	8-729-403-35	TRANSISTOR UN5113
Q613	8-729-402-42	TRANSISTOR UN5213
Q614	8-729-903-97	TRANSISTOR FMS1FE
Q615	8-729-903-82	TRANSISTOR FMW2
Q616	8-729-117-32	TRANSISTOR 2SC4177
Q617	8-729-903-97	TRANSISTOR FMS1FE
Q618	8-729-903-97	TRANSISTOR FMS1FE
Q619	8-729-907-00	TRANSISTOR DTC114EU
Q620	8-729-421-90	TRANSISTOR XN4113
Q621	8-729-420-12	TRANSISTOR XN4213
Q622	8-729-422-14	TRANSISTOR XN4111
Q623	8-729-117-32	TRANSISTOR 2SC4177
Q624	8-729-422-14	TRANSISTOR XN4111
Q643	8-729-403-24	TRANSISTOR XN4210
Q644	8-729-403-35	TRANSISTOR UN5113
Q645	8-729-402-42	TRANSISTOR UN5213
Q661	8-729-117-32	TRANSISTOR 2SC4177
Q662	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q663	8-729-117-32	TRANSISTO
Q664	8-729-140-63	TRANSISTO
Q665	8-729-117-32	TRANSISTO
Q681	8-729-117-32	TRANSISTO
Q682	8-729-820-42	TRANSISTO
Q683	8-729-902-93	TRANSISTO
Q684	8-729-903-97	TRANSISTO

BOARD (CONDUCTOR SIDE)



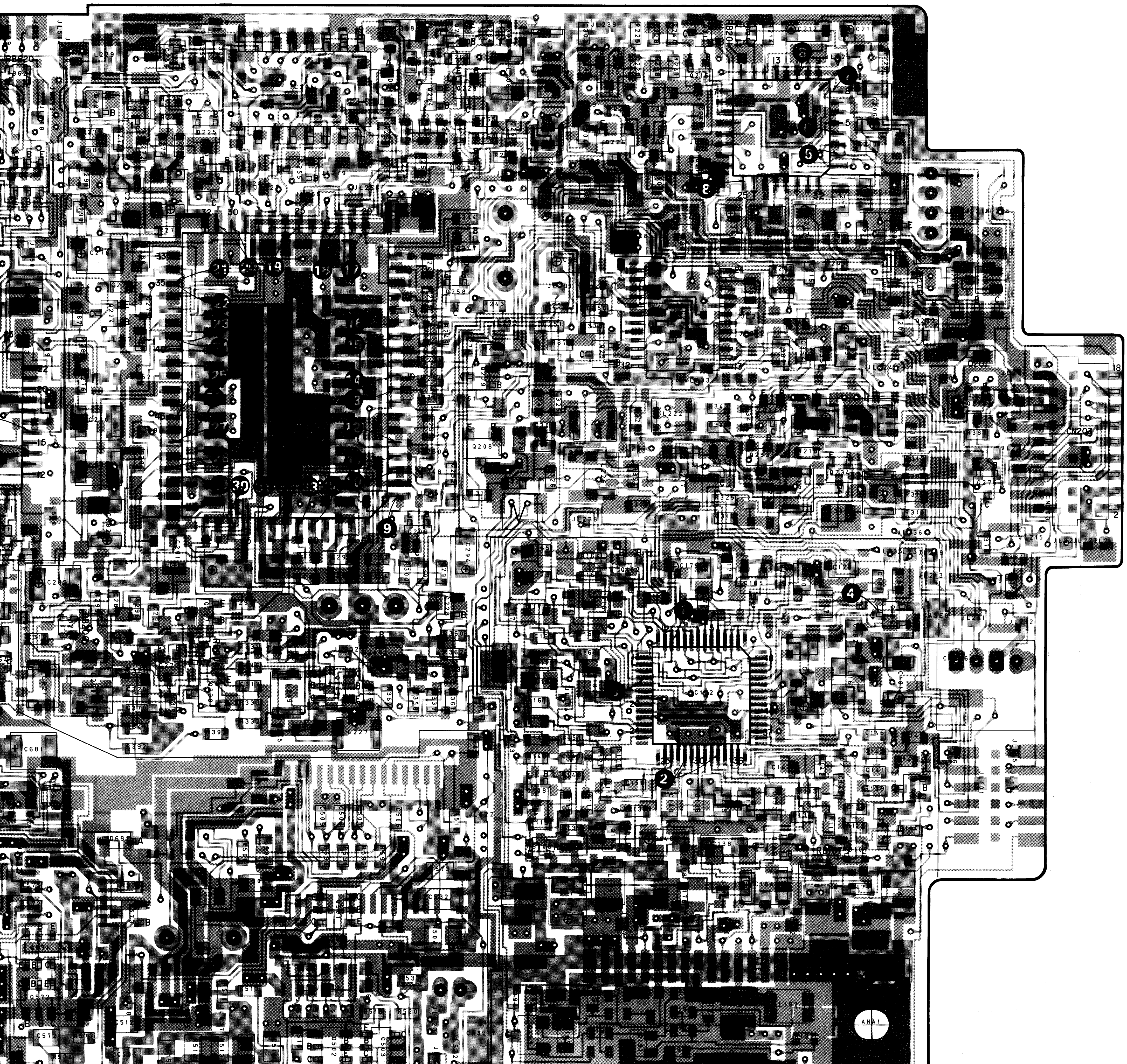
N5213
N5113
N4213
SC2223-F13
SC4177

SC4177
N5113
N4213
N5113
N5213

SC4177
SC4177
N5113
TC144TU
N5213

TC144TU
TA144TU
SC4177
SA1611-M5M6
SA1611-M5M6

Q272	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q275	8-729-402-42	TRANSISTOR UN5213
Q276	8-729-403-35	TRANSISTOR UN5113
Q501	8-729-403-27	TRANSISTOR XN4401
Q502	8-729-822-94	TRANSISTOR FC102
Q503	8-729-822-94	TRANSISTOR FC102
Q541	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q542	8-729-117-32	TRANSISTOR 2SC4177
Q543	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q571	8-729-403-27	TRANSISTOR XN4401
Q572	8-729-403-27	TRANSISTOR XN4401
Q573	8-729-117-32	TRANSISTOR 2SC4177
Q601	8-729-403-24	TRANSISTOR XN4210
Q602	8-729-403-24	TRANSISTOR XN4210
Q603	8-729-403-24	TRANSISTOR XN4210
Q604	8-729-403-24	TRANSISTOR XN4210
Q606	8-729-403-24	TRANSISTOR XN4210
Q607	8-729-403-24	TRANSISTOR XN4210
Q608	8-729-403-24	TRANSISTOR XN4210
Q609	8-729-403-24	TRANSISTOR XN4210
Q610	8-729-403-24	TRANSISTOR XN4210
Q611	8-729-420-12	TRANSISTOR XN4213
Q612	8-729-403-35	TRANSISTOR UN5113
Q613	8-729-402-42	TRANSISTOR UN5213
Q614	8-729-903-97	TRANSISTOR FMS1FE
Q615	8-729-903-82	TRANSISTOR FMW2
Q616	8-729-117-32	TRANSISTOR 2SC4177
Q617	8-729-903-97	TRANSISTOR FMS1FE
Q618	8-729-903-97	TRANSISTOR FMS1FE
Q619	8-729-907-00	TRANSISTOR DTC114EU
Q620	8-729-421-90	TRANSISTOR XN4113
Q621	8-729-420-12	TRANSISTOR XN4213
Q622	8-729-422-14	TRANSISTOR XN4111
Q623	8-729-117-32	TRANSISTOR 2SC4177
Q624	8-729-422-14	TRANSISTOR XN4111
Q643	8-729-403-24	TRANSISTOR XN4210
Q644	8-729-403-35	TRANSISTOR UN5113
Q645	8-729-402-42	TRANSISTOR UN5213
Q661	8-729-117-32	TRANSISTOR 2SC4177
Q662	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q663	8-729-117-32	TRANSISTOR 2SC4177
Q664	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q665	8-729-117-32	TRANSISTOR 2SC4177
Q681	8-729-117-32	TRANSISTOR 2SC4177
Q682	8-729-820-42	TRANSISTOR 2SB1202FAS
Q683	8-729-902-93	TRANSISTOR FMG4
Q684	8-729-903-97	TRANSISTOR FMS1FE



VS-67 (HEAD AMP) SCHEMATIC DIAGRAMS

— Ref. No. VS-67 BOARD: 5000 series —

- Fo
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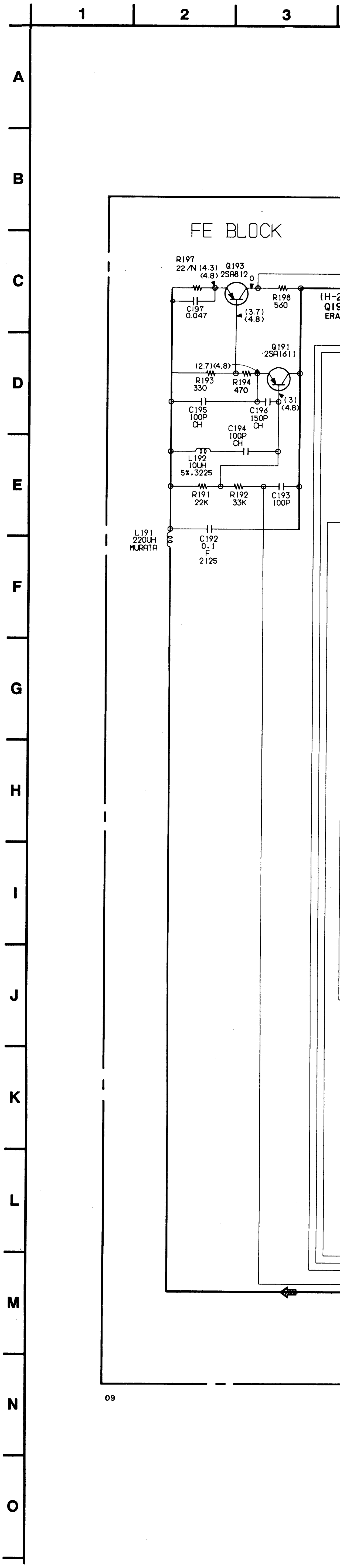
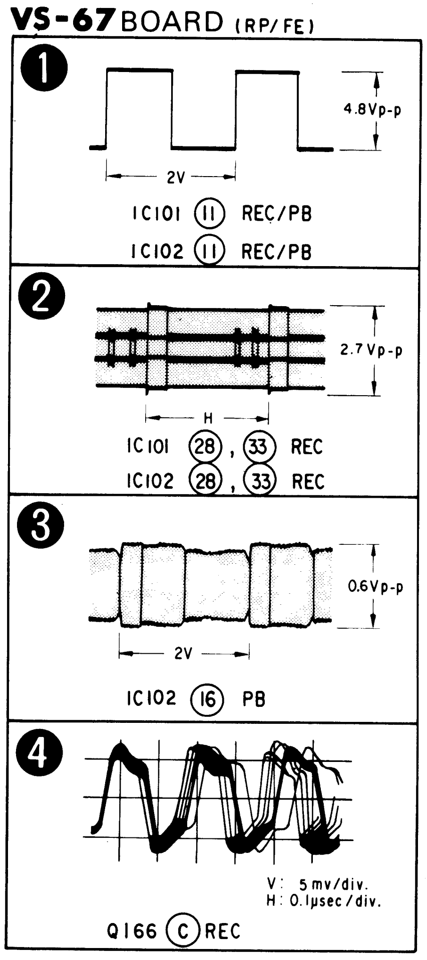
pos


1
2
3
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
FE BLOCK
R197 22/N (4.3)
Q193 (4.8) 2SA812
C197 0.047
(3.7) (4.8)
R198 560
Q191 2SA1611
(2.7)(4.8)
R193 330
R194 470
(3) (4.8)
C195 100P CH
C196 150P CH
C194 100P CH
L192 10UH 5%.3225
R191 22K
R192 33K
C193 100P
L191 220UH MURATA
C192 0.1 F 2125
09

VS-67 BOARD (RP/FE)



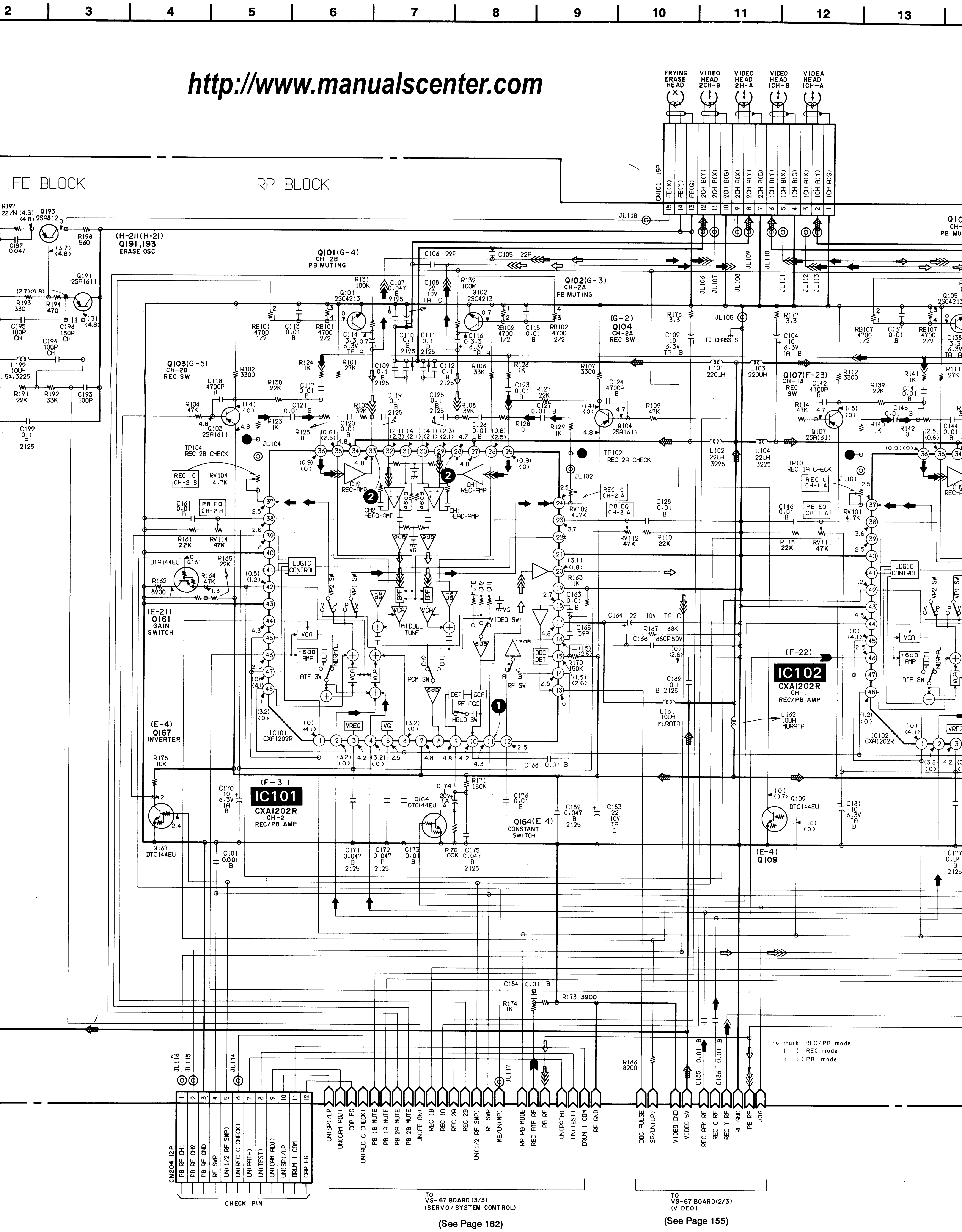
- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➤		

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡>	➡>>	➡
PB			⇨>>	⇨

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


2
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8
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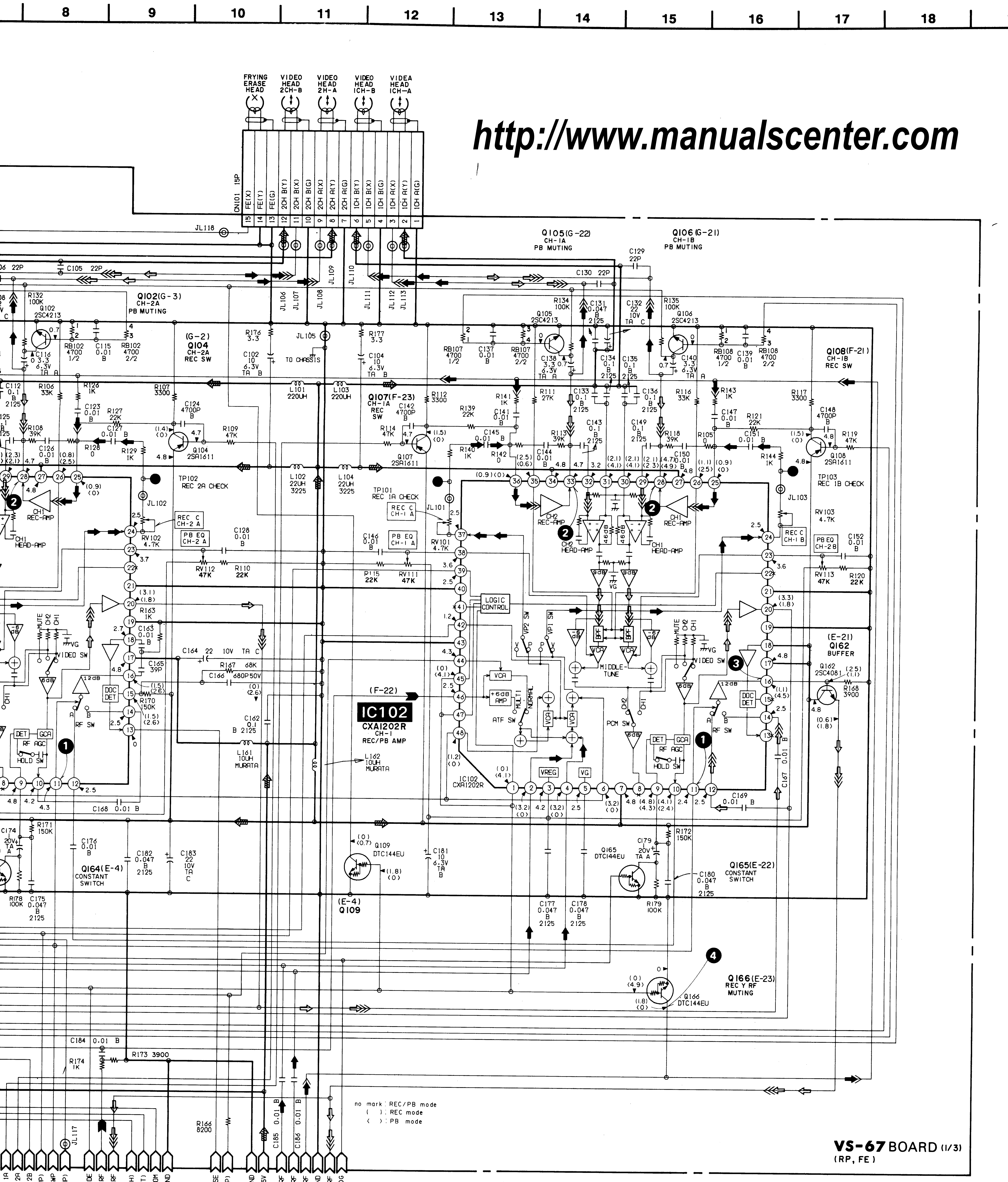
10
11
12
13
FE BLOCK
RP BLOCK
FRYING ERASE HEAD
VIDEO HEAD 2CH-B
VIDEO HEAD 2H-A
VIDEO HEAD ICH-B
VIDEA HEAD ICH-A
CN101 15P
Q191,193 ERASE OSC
Q101(G-4) CH-2B PB MUTING
Q102(G-3) CH-2A PB MUTING
Q103(G-5) CH-2B REC SW
(G-2) Q104 CH-2A REC SW
Q107(F-23) CH-1A REC SW
TP104 REC 2B CHECK
TP102 REC 2A CHECK
TP101 REC 1A CHECK
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
MIDDLE-TUNE
VIDEO SW
PCM SW
ATF SW
RF SW
RF AGC
HOLD SW
DOC DET
(E-21) Q161 GAIN SWITCH
(E-4) Q167 INVERTER
(F-3) IC101 CXA1202R CH-2 REC/PB AMP
(F-22) IC102 CXA1202R CH-1 REC/PB AMP
Q164(E-4) CONSTANT SWITCH
(E-4) Q109
CN204 12P
CHECK PIN
TO VS-67 BOARD (3/3) (SERVO/SYSTEM CONTROL)
(See Page 162)
TO VS-67 BOARD(2/3) (VIDEO)
(See Page 155)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode


8
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14
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18
19
FRYING ERASE HEAD
VIDEO HEAD 2CH-B
VIDEO HEAD 2H-A
VIDEO HEAD ICH-B
VIDEA HEAD ICH-A
CN101 15P
FE(X)
FE(Y)
FE(G)
2CH B(Y)
2CH B(X)
2CH B(G)
2CH A(X)
2CH A(Y)
2CH A(G)
1CH B(Y)
1CH B(X)
1CH B(G)
1CH A(X)
1CH A(Y)
1CH A(G)
JL118
Q105(G-22) CH-IA PB MUTING
Q106(G-21) CH-IB PB MUTING
Q102(G-3) CH-2A PB MUTING
(G-2) Q104 CH-2A REC SW
Q107(F-23) CH-IA REC SW
Q108(F-21) CH-IB REC SW
TP102 REC 2A CHECK
TP101 REC IA CHECK
TP103 REC IB CHECK
CH1 REC-AMP
CH1 HEAD-AMP
CH2 REC-AMP
CH2 HEAD-AMP
REC C CH-2 A
PB EQ CH-2 A
REC C CH-1 A
PB EQ CH-1 A
REC C CH-1 B
PB EQ CH-2 B
LOGIC CONTROL
VIDEO SW
RF SW
RF AGC
HOLD SW
DET
GCA
DOC DET
VCA
+6dB AMP
ATF SW
MULTI
NORMAL
MIDDLE-TUNE
PCM SW
VREG
VG
BPF
IC102 CXA1202R CH-I REC/PB AMP
(F-22)
(E-21) Q162 BUFFER
Q162 2SC4081
Q109 DTC144EU
(E-4) Q109
Q164(E-4) CONSTANT SWITCH
Q165(E-22) CONSTANT SWITCH
Q165 DTC144EU
Q166(E-23) REC Y RF MUTING
Q166 DTC144EU
L101 220UH
L103 220UH
L102 22UH 3225
L104 22UH 3225
L161 10UH MURATA
L162 10UH MURATA
RV101 4.7K
RV102 4.7K
RV103 4.7K
RV111 47K
RV112 47K
RV113 47K
R173 3900
R174 1K
R166 8200
C184 0.01 B
C185 0.01 B
C186 0.01 B
JL117
REC 1A
REC 2A
REC 2B
UN(1/2 RF SWP)
RF SWP
ME/UN(MP)
RP PB MODE
REC ATF RF
PB RF
UN(PATH)
UN(TEST)
DRUM 1 COM
RP GND
DOC PULSE
SP/UN(LP)
VIDEO GND
VIDEO 5V
REC AFM RF
REC C RF
REC Y RF
RF GND
PB RF
JOG

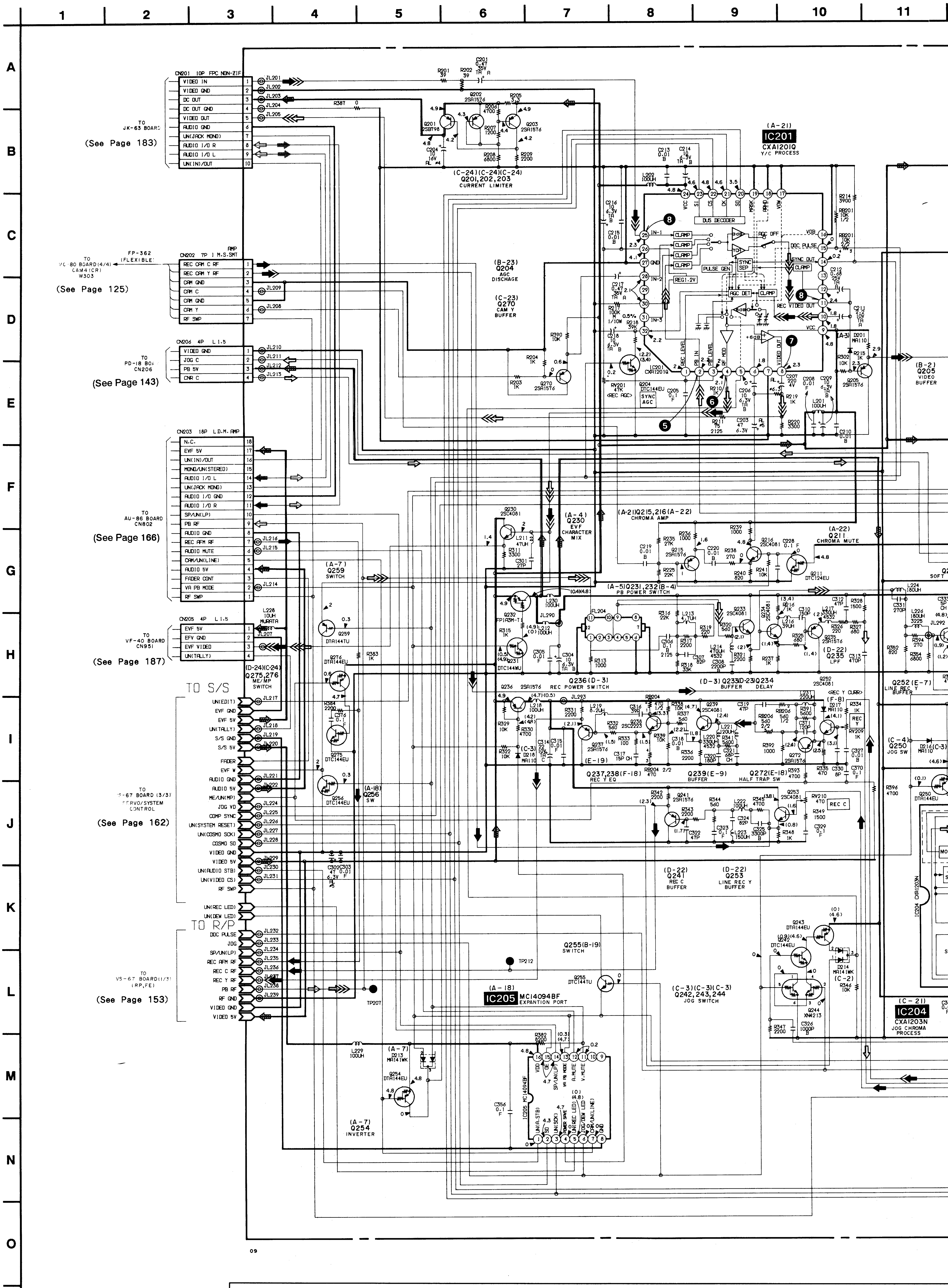
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode

VS-67 BOARD (1/3)
(RP, FE)

67 BOARD (3/3)
RVO/ SYSTEM CONTROL)
(See Page 162)

TO
VS-67 BOARD(2/3)
(VIDEO)
(See Page 155)

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1
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11
A
B
C
D
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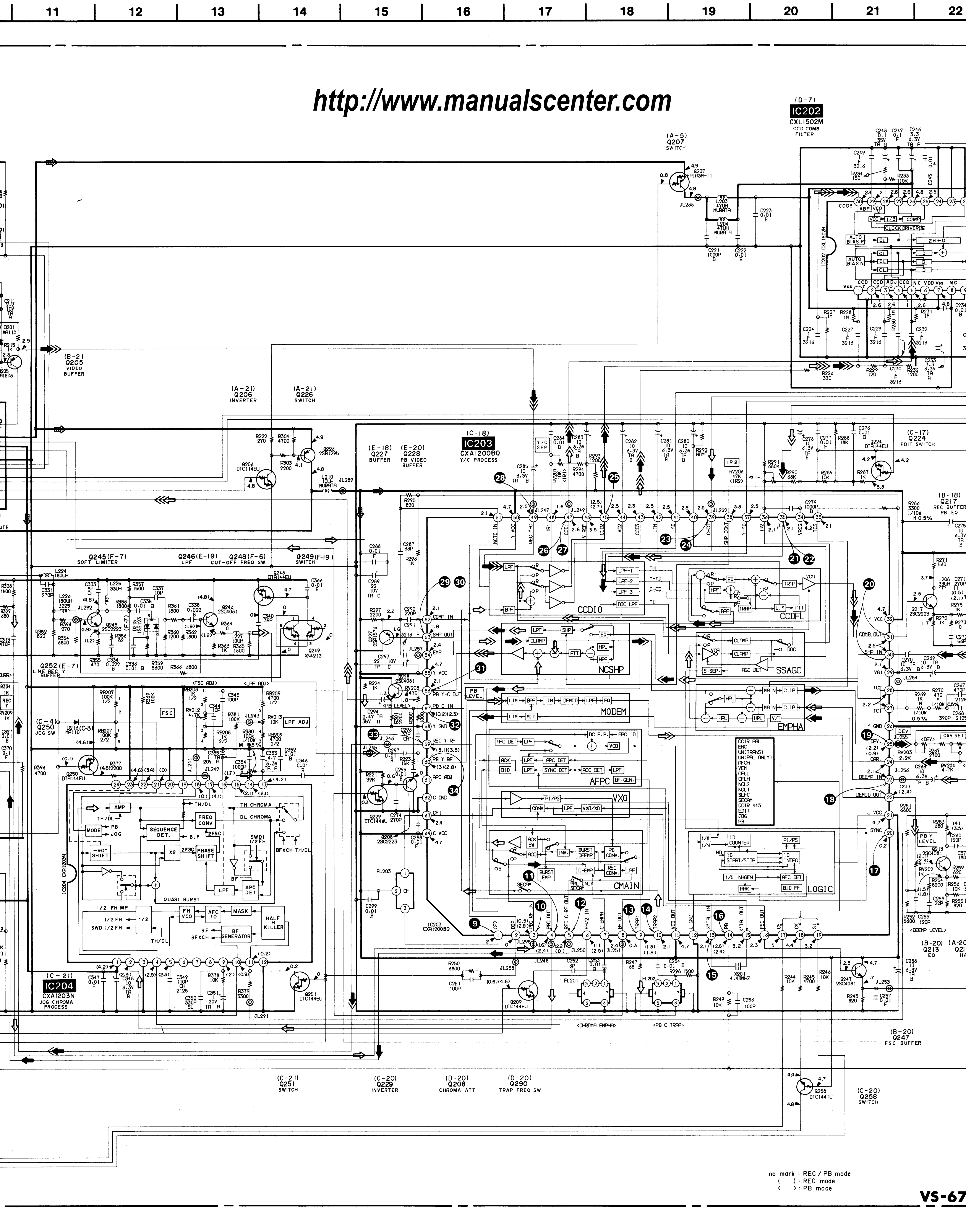
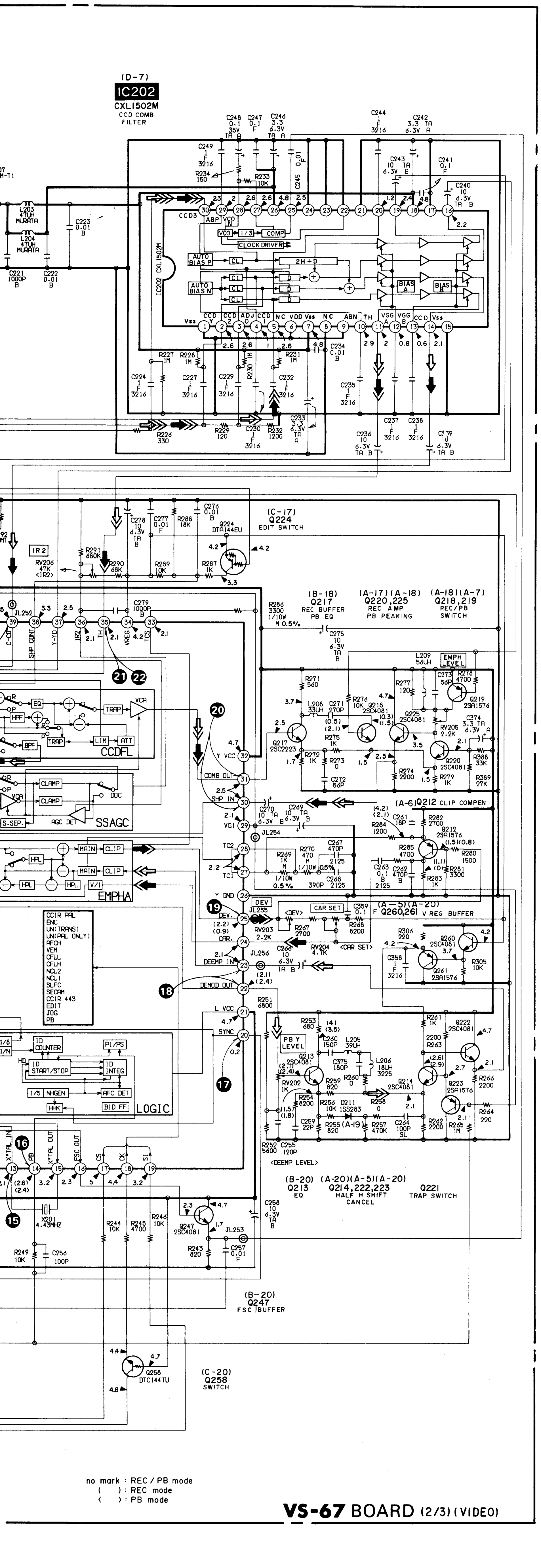
I
J
K
L
M
N
O
CN201 10P FPC NON-ZIF
VIDEO IN
VIDEO GND
DC OUT
DC OUT GND
VIDEO OUT
AUDIO GND
UN(JACK MONO)
AUDIO I/O R
AUDIO I/O L
UN(IN)/OUT
TO JK-63 BOARD
(See Page 183)
CN202 7P I.M.S.SMT
REC CAM C RF
REC CAM Y RF
CAM GND
CAM C
CAM GND
CAM Y
RF SWP
FP-362 (FLEXIBLE)
TO VC-80 BOARD (4/4) CAM4 (CR) W303
(See Page 125)
CN206 4P L1.5
VIDEO GND
JOG C
PB 5V
CNR C
TO PD-18 BOARD CN206
(See Page 143)
CN203 18P L.D.M. AMP
N.C.
EVF 5V
UN(IN)/OUT
MONO/UN(STEREO)
AUDIO I/O L
UN(JACK MONO)
AUDIO I/O GND
AUDIO I/O R
SP/UN(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/UN(LINE)
AUDIO 5V
FADER CONT
VR PB MODE
RF SWP
TO AU-86 BOARD CN802
(See Page 166)
CN205 4P L1.5
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
TO VF-40 BOARD CN951
(See Page 187)
TO S/S
UN(EDIT)
EVF GND
EVF 5V
UN(TALLY)
S/S GND
S/S 5V
FADER
EVF W
AUDIO GND
AUDIO 5V
ME/UN(MP)
JOG VD
COMP SYNC
UN(SYSTEM RESET)
UN(COSMO SCK)
COSMO SO
VIDEO GND
VIDEO 5V
UN(AUDIO STB)
UN(VIDEO CS)
RF SWP
UN(REC LED)
UN(DEW LED)
TO VS-67 BOARD (3/3) SERVO/SYSTEM CONTROL
(See Page 162)
TO R/P
DOC PULSE
JOG
SP/UN(LP)
REC AFM RF
REC C RF
REC Y RF
PB RF
RF GND
VIDEO GND
VIDEO 5V
TO VS-67 BOARD (1/3) (RP, FE)
(See Page 153)
(C-24)(C-24)(C-24) Q201,202,203 CURRENT LIMITER
(B-23) Q204 AGC DISCHAGE
(C-23) Q270 CAM Y BUFFER
(A-21) IC201 CXA1201Q Y/C PROCESS
DUS DECODER
CLAMP
AGC OFF
SYNC SEP
PULSE GEN
REG1.2V
AGC DET
REC VIDEO OUT
(B-2) Q205 VIDEO BUFFER
(A-4) Q230 EVF CHARACTER MIX
(A-21) Q215,216 (A-22) CHROMA AMP
(A-22) Q211 CHROMA MUTE
(A-7) Q259 SWITCH
(A-5) Q231,232 (B-4) PB POWER SWITCH
(D-22) Q235 LPF
(D-24)(C-24) Q275,276 ME/MP SWITCH
Q236 (D-3) REC POWER SWITCH
(D-3) Q233 (D-3) Q234 BUFFER DELAY
Q237,238 (F-18) REC Y EQ
Q239 (E-9) BUFFER
Q272 (E-18) HALF TRAP SW
(A-18) Q256 SW
(D-22) Q241 REC C BUFFER
(D-22) Q253 LINE REC Y BUFFER
Q252 (E-7) LINE REC Y BUFFER
(C-4) Q250 JOG SW
Q255 (B-19) SWITCH
TP212
TP207
(A-18) IC205 MC14094BF EXPANTION PORT
(C-3)(C-3)(C-3) Q242,243,244 JOG SWITCH
(C-21) IC204 CXA1203N JOG CHROMA PROCESS
(A-7) Q254 INVERTER
09


11
12
13
14
15
16
17
18
19
20
21
22
(D-7)
IC202
CXL1502M
CCD COMB FILTER
(A-5)
Q207
SWITCH
(C-18)
IC203
CXA1200BQ
Y/C PROCESS
(C-21)
IC204
CXA1203N
JOG CHROMA PROCESS
(B-2)
Q205
VIDEO BUFFER
(A-21)
Q206
INVERTER
(A-21)
Q226
SWITCH
(E-18)
Q227
BUFFER
(E-20)
Q228
PB VIDEO BUFFER
(C-17)
Q224
EDIT SWITCH
(B-18)
Q217
REC BUFFER PB EQ
Q245(F-7)
SOFT LIMITER
Q246(E-19)
LPF
Q248(F-6)
CUT-OFF FREQ SW
Q249(F-19)
SWITCH
Q252(E-7)
LINE REC Y BUFFER
(C-4)
Q250
JOG SW
CCDIO
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
CMAIN
LOGIC
<FSC ADJ>
<LPF ADJ>
<PB LEVEL>
<CHROMA EMPHA>
<PB C TRAP>
<DEEMP LEVEL>
<DEV>
(B-20)
Q213
EQ
(B-20)
Q247
FSC BUFFER
(C-21)
Q251
SWITCH
(C-20)
Q229
INVERTER
(D-20)
Q208
CHROMA ATT
(D-20)
Q290
TRAP FREQ SW
(C-20)
Q258
SWITCH
X201
4.43MHZ

no mark : REC / PB mode
( ) : REC mode
< > : PB mode

VS-67


(D-7)
IC202
CXL1502M
CCD COMB FILTER
(C-17)
Q224
EDIT SWITCH
(B-18)
Q217
REC BUFFER
PB EQ
(A-17)(A-18)
Q220,225
REC AMP
PB PEAKING
(A-18)(A-7)
Q218,219
REC/PB SWITCH
EMPH LEVEL
(A-6)Q212 CLIP COMPEN
(A-5)(A-20)
Q260,261 V.REG BUFFER
CAR SET
DEV
CCDFL
SSAGC
EMPHA
LOGIC
PB Y LEVEL
<DEEMP LEVEL>
(B-20)
Q213
EQ
(A-20)(A-5)(A-20)
Q214,222,223
HALF H SHIFT CANCEL
Q221
TRAP SWITCH
(B-20)
Q247
FSC BUFFER
(C-20)
Q258
SWITCH
X201
4.43MHz

no mark : REC / PB mode
( ) : REC mode
< > : PB mode

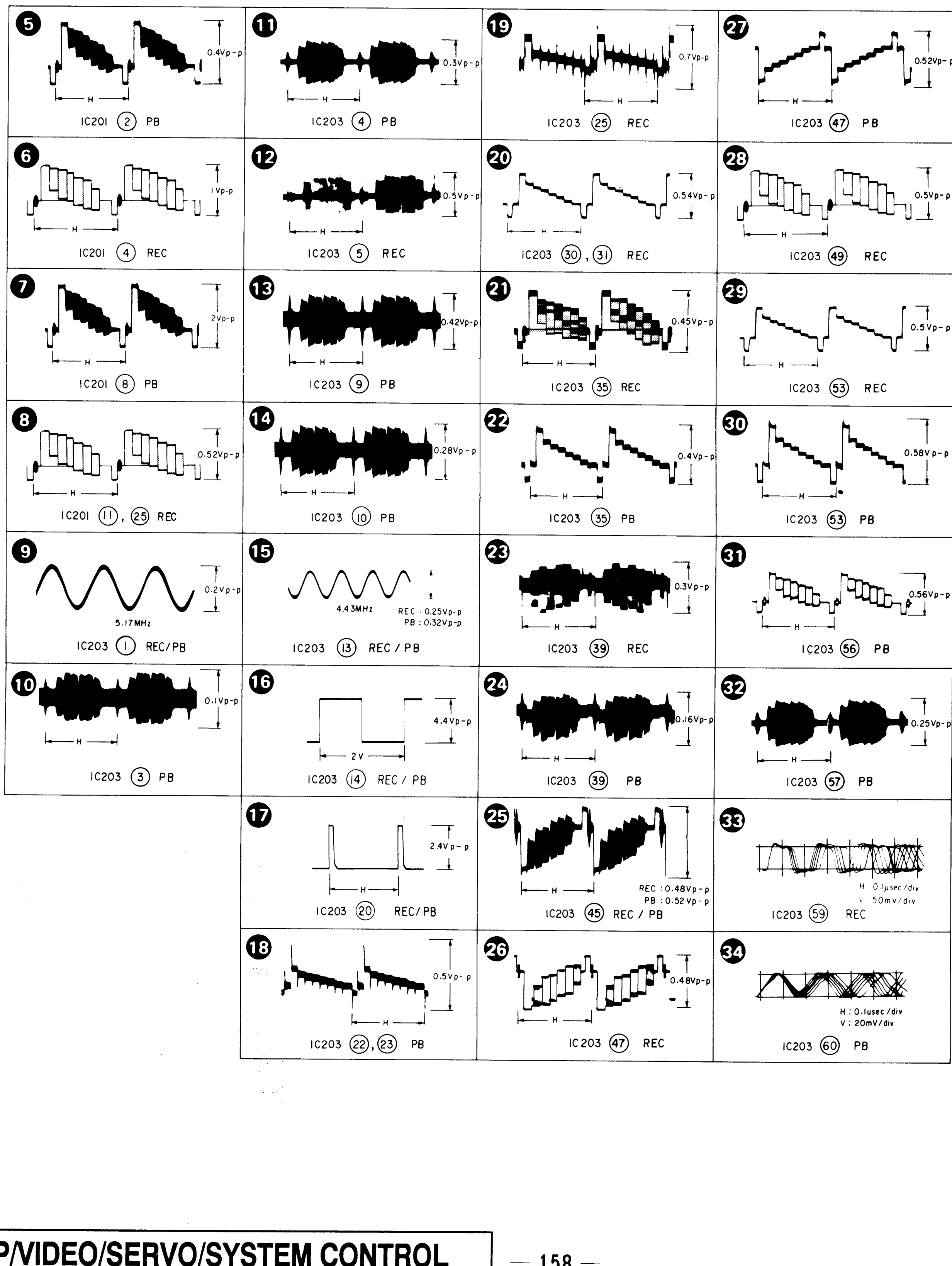
VS-67 BOARD (2/3) (VIDEO)

http://www.manualscenter.com

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

VS-67 BOARD (VIDEO)

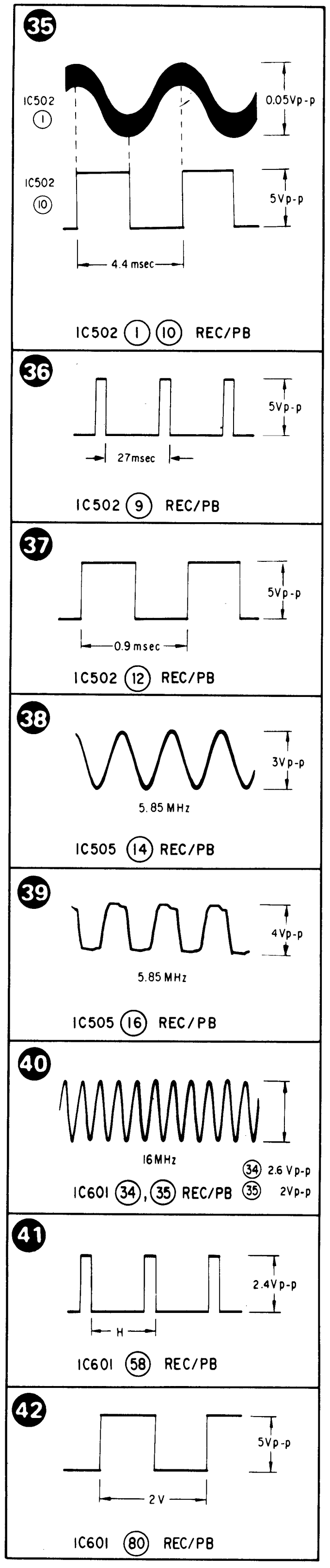


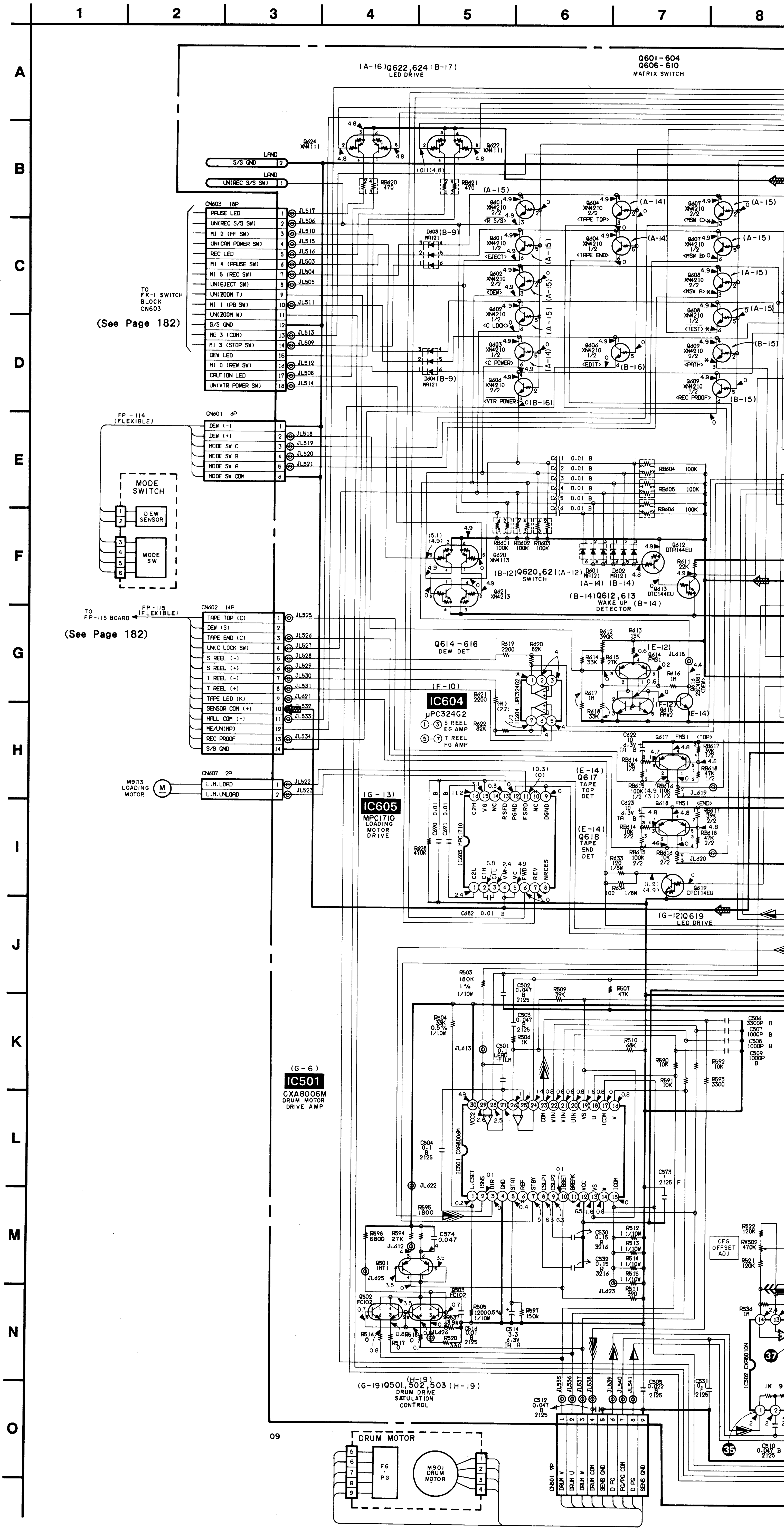
VS-67 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAMS

— Ref. No. VS-67 BOARD: 5000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

VS-67 BOARD (SYSCON/SERVO)





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A
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C
D
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G
H
I
J
K
L
M
N
O
(A-16)Q622,624(B-17) LED DRIVE
Q601-604 Q606-610 MATRIX SWITCH
Q624 XN4111
Q622 XN4111
S/S GND
UN(REC S/S SW)
LAND
RB620 470
RB621 470
CN603 18P
PAUSE LED
UN(REC S/S SW)
MI 2 (FF SW)
UN(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
MI 5 (REC SW)
UN(EJECT SW)
UN(ZOOM T)
MI 1 (PB SW)
UN(ZOOM W)
S/S GND
MO 3 (COM)
MI 3 (STOP SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
UN(VTR POWER SW)
TO FK-1 SWITCH BLOCK CN603
(See Page 182)
D603 (B-9) MA121
D604 (B-9) MA121
Q601 XN4210
Q604 XN4210
Q607 XN4210
Q602 XN4210
Q603 XN4210
Q606 XN4210
Q608 XN4210
Q609 XN4210
<R S/S>
<EJECT>
<DEW>
<C LOCK>
<C POWER>
<VTR POWER>
<TAPE TOP>
<TAPE END>
<EDIT>
<MSW C>
<MSW B>
<MSW A>
<TEST>
<PATH>
<REC PROOF>
FP-114 (FLEXIBLE)
CN601 6P
DEW (-)
DEW (+)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
MODE SWITCH
DEW SENSOR
MODE SW
C611 0.01 B
C612 0.01 B
C613 0.01 B
C614 0.01 B
C615 0.01 B
C616 0.01 B
RB604 100K
RB605 100K
RB606 100K
RB601 100K
RB602 100K
RB603 100K
Q620 XN4113
Q621 XN4213
(B-12)Q620,621(A-12) SWITCH
D601 MA121
D602 MA121
Q612 DTA144EU
Q613 DTC144EU
(B-14)Q612,613 WAKE UP (B-14) DETECTOR
R611 22K
TO FP-115 BOARD
FP-115 (FLEXIBLE)
(See Page 182)
CN602 14P
TAPE TOP (C)
DEW (S)
TAPE END (C)
UNIC LOCK SW)
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/UN(MP)
REC PROOF
S/S GND
Q614-616 DEW DET
R619 2200
R620 82K
(F-10)
IC604
μPC324G2
①-③ S REEL EG AMP
⑤-⑦ T REEL FG AMP
R621 2200
R622 82K
R612 390K
R613 15K
R614 33K
R615 27K
R616 1M
R617 1M
R618 33K
Q614 FMS1
Q615 FMW2
Q616 2SD601
JL618
CN607 2P
L.M.LOAD
L.M.UNLOAD
M903 LOADING MOTOR
(G-13)
IC605
MPC1710 LOADING MOTOR DRIVE
R628 470K
C682 0.01 B
(E-14) Q617 TAPE TOP DET
(E-14) Q618 TAPE END DET
Q617 FMS1 <TOP>
Q618 FMS1 <END>
RB617 39K
RB618 47K
RB614 10K
RB615 100K
RB616 10K
R633 120 1/8W
R634 100 1/8W
Q619 DTC144EU
(G-12)Q619 LED DRIVE
JL619
JL620
R503 180K 1% 1/10W
C502 0.047 B
R509 39K
R507 47K
R504 33K 0.5% 1/10W
C503 0.047 B
R506 1K
C501 0.1 LEAD FILM
R510 68K
R590 10K
R591 10K
R592 10K
R593 3300
C506 3300P B
C507 1000P B
C508 1000P B
C509 1000P B
JL613
(G-6)
IC501
CXA8006M DRUM MOTOR DRIVE AMP
C504 0.1 B
JL622
R595 1800
C573 F
C574 0.047
R598 6800
R594 27K
JL612
Q501 IMT1
JL625
Q502 FC102
Q503 FC102
R505 1200 0.5% 1/10W
R597 150k
R537 3.9K
R520 330
R516
R517
R518
C514 0.01 B
C516 3.3 6.3V TA A
C530 0.15
C532 0.15
R512 1 1/10W
R513 1 1/10W
R514 1 1/10W
R515 1 1/10W
R511 390
JL623
JL624
(H-19)
(G-19)Q501,502,503(H-19) DRUM DRIVE SATULATION CONTROL
C512 0.047 B
C505 0.022 B
C531
R522 120K
RV502 470K
R521 120K
CFG OFFSET ADJ
R536 1M
IC502 CXP80110N
C510 0.047 B
09
DRUM MOTOR
FG PG
M901 DRUM MOTOR
CN501 9P
DRUM V
DRUM U
DRUM W
DRUM COM
SENS GND
D FG
FG/PG COM
D PG
SENS GND
JL535
JL536
JL537
JL538
JL539
JL540
JL541

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				
PB			⇨⟫	

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷>	
Drum servo (speed and phase)		▷>>	
Capstan speed servo			
Capstan phase servo			⊐⟫
Capstan servo (speed and phase)		⊐⟫	
Ref. signal	➤		⊐

r indicates the
oard.

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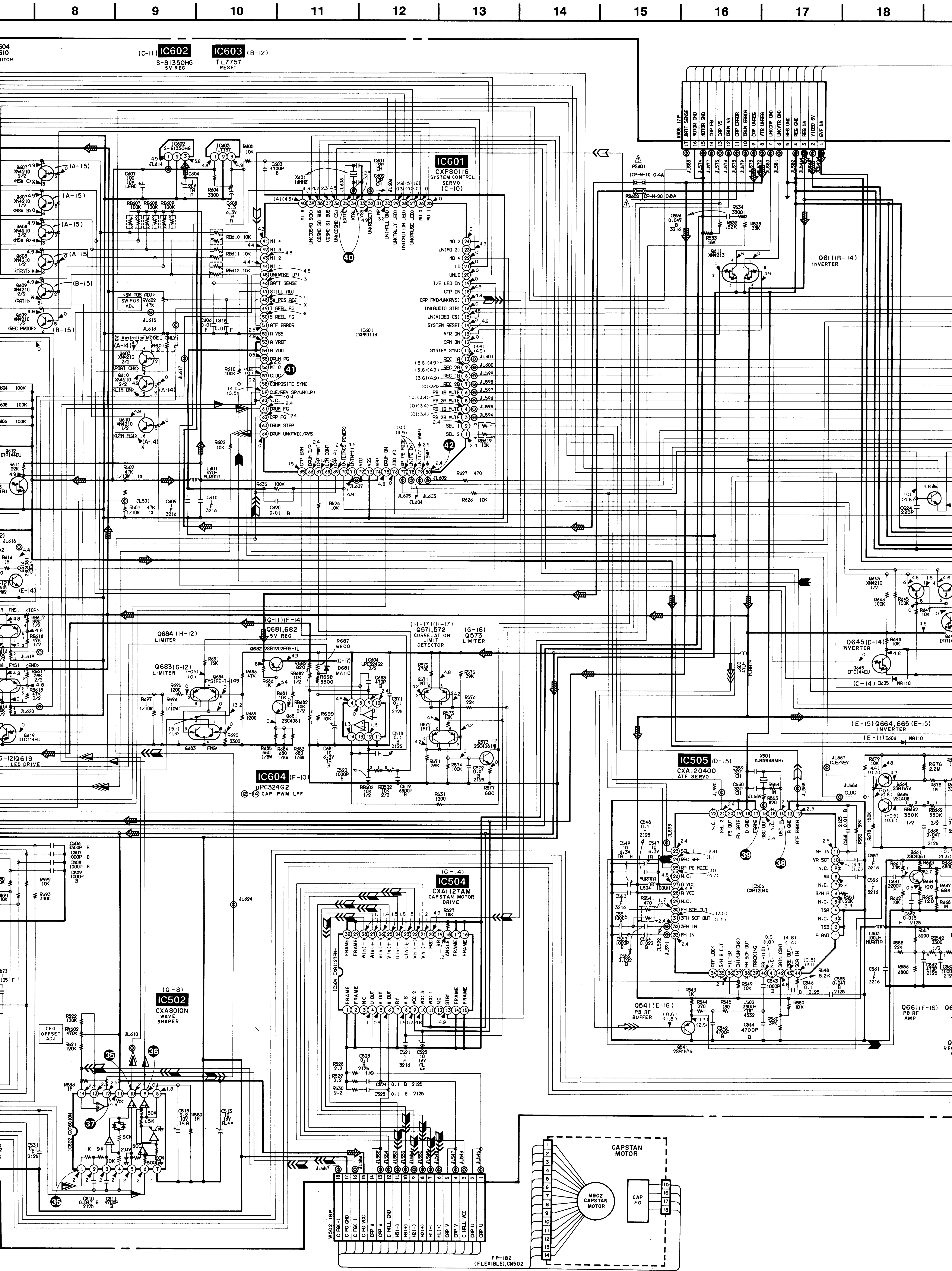
8
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18
IC602 (C-11) S-81350HG 5V REG
IC603 (B-12) TL7757 RESET
IC601 CXP80116 SYSTEM CONTROL SERVO (C-10)
X601 16MHZ
Q611 (B-14) INVERTER
PS601 ICP-N-10 0.4A
PS602 ICP-N-20 0.8A
CN605 17P
BATT SENSE
MOTOR GND
CAP FG
DRUM VS
CAP ERROR
DRUM ERROR
CPM UNREG
VTR UNREG
REG GND
REG 5V
VIDEO 5V
EVF 5V
Q684 (H-12) LIMITER
Q683 (G-12) LIMITER
Q681,682 (G-11)(F-14) 5V REG
Q571,572 (H-17)(H-17) CORRELATION LIMIT DETECTOR
Q573 (G-18) LIMITER
IC604 (F-10) μPC324G2 ⑫-⑭ CAP PWM LPF
(G-12)Q619 LED DRIVE
Q645 (D-14) INVERTER
(E-15) Q664,665 (E-15) INVERTER
IC505 (D-15) CXA1204OQ ATF SERVO
X501 5.85938MHz
Q541 (E-16) PB RF BUFFER
Q661 (F-16) PB RF AMP
IC504 (G-14) CXA1127AM CAPSTAN MOTOR DRIVE
IC502 (G-8) CXA8010N WAVE SHAPER
CFG OFFSET ADJ
CN502 18P
FP-182 (FLEXIBLE), CN502
CAPSTAN MOTOR
M902 CAPSTAN MOTOR
CAP FG
L601 47UH MURATA
L602 47UH MURATA
<SW POS ADJ> SW POS ADJ RV602 47K
E, Australian MODEL ONLY
35
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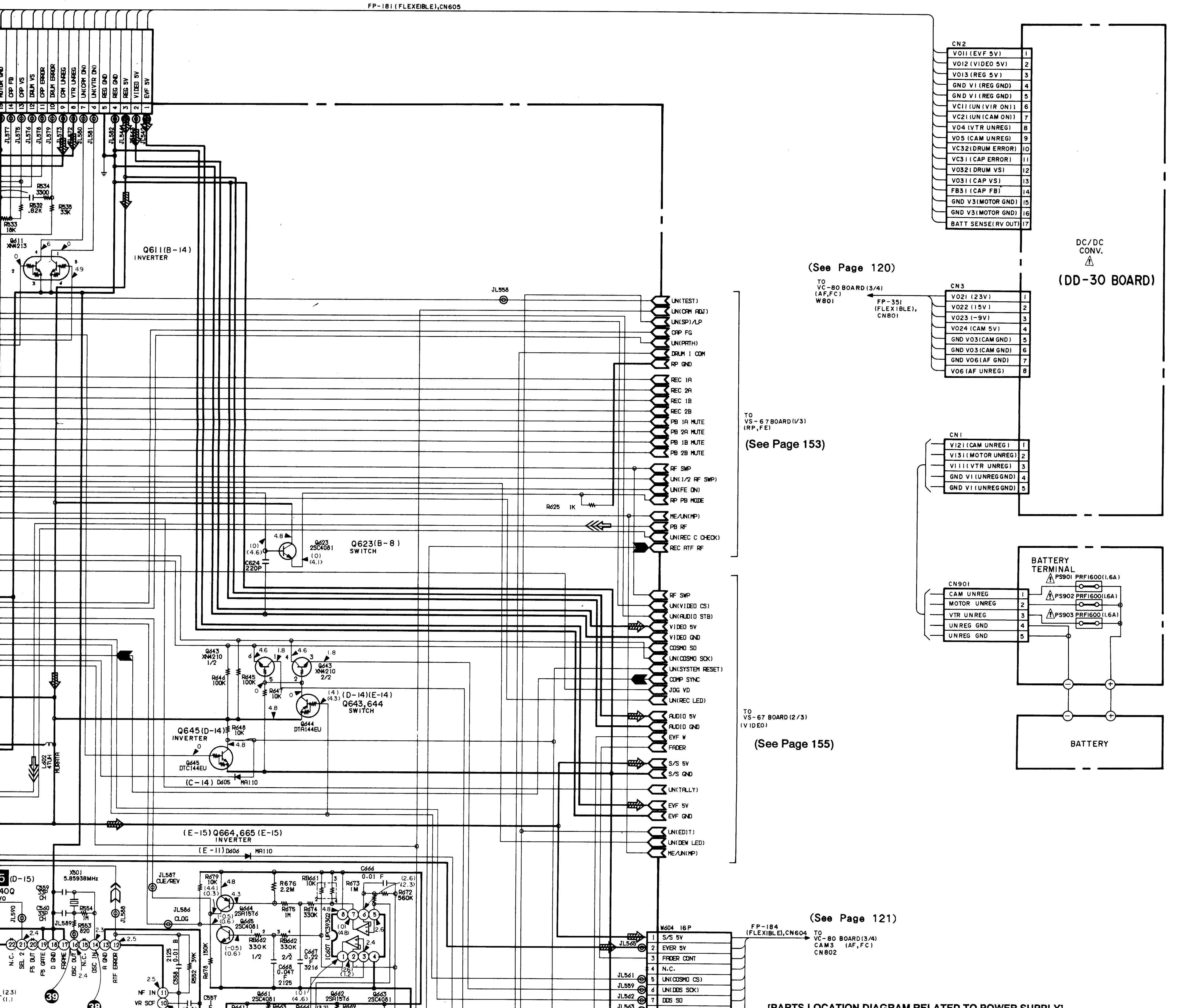
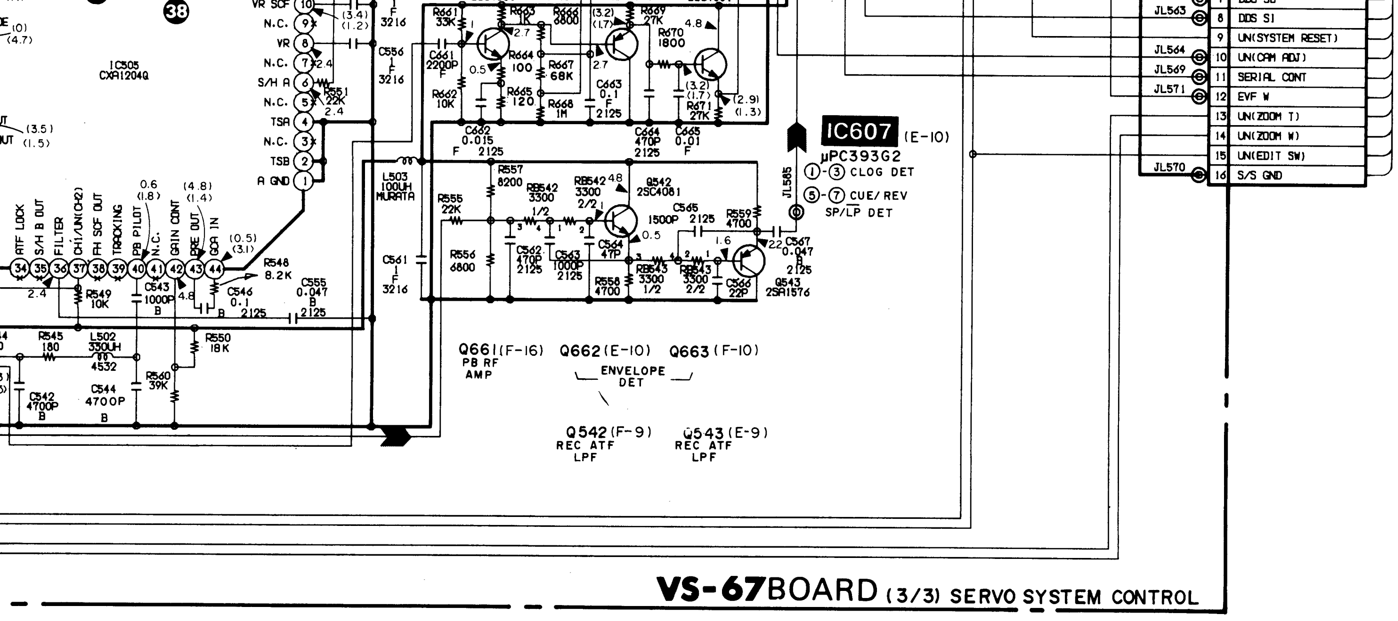
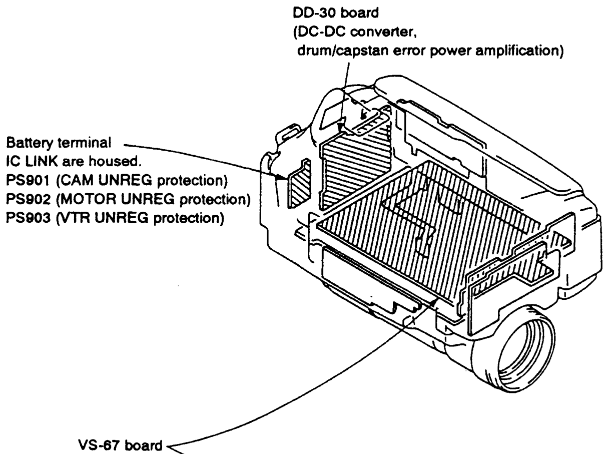

FP-181 (FLEXIBLE), CN605
CN2
VO11 (EVF 5V)
VO12 (VIDEO 5V)
VO13 (REG 5V)
GND V1 (REG GND)
GND V1 (REG GND)
VC11 (UN (VTR ON))
VC21 (UN (CAM ON))
VO4 (VTR UNREG)
VO5 (CAM UNREG)
VC32 (DRUM ERROR)
VC31 (CAP ERROR)
VO32 (DRUM VS)
VO31 (CAP VS)
FB31 (CAP FB)
GND V3 (MOTOR GND)
GND V3 (MOTOR GND)
BATT SENSE (RV OUT)
DC/DC CONV.
(DD-30 BOARD)
(See Page 120)
TO VC-80 BOARD (3/4) (AF, FC) W801
FP-351 (FLEXIBLE), CN801
CN3
VO21 (23V)
VO22 (15V)
VO23 (-9V)
VO24 (CAM 5V)
GND VO3 (CAM GND)
GND VO3 (CAM GND)
GND VO6 (AF GND)
VO6 (AF UNREG)
CN1
VI21 (CAM UNREG)
VI31 (MOTOR UNREG)
VI11 (VTR UNREG)
GND V1 (UNREG GND)
GND V1 (UNREG GND)
BATTERY TERMINAL
PS901 PRF1600 (1.6A)
PS902 PRF1600 (1.6A)
PS903 PRF1600 (1.6A)
CN901
CAM UNREG
MOTOR UNREG
VTR UNREG
UNREG GND
UNREG GND
BATTERY
Q611 (B-14) INVERTER
Q611 XN4213
JL558
UN (TEST)
UN (CAM ADJ)
UN (SP)/LP
CAP FG
UN (PATH)
DRUM 1 COM
RP GND
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
RF SWP
UN (1/2 RF SWP)
UN (FE ON)
RP PB MODE
ME/UN (HP)
PB RF
UN (REC C CHECK)
REC ATF RF
TO VS-67 BOARD (1/3) (RP, FE)
(See Page 153)
R625 1K
Q623 2SC4081
Q623 (B-8) SWITCH
C624 220P
RF SWP
UN (VIDEO CS)
UN (AUDIO STB)
VIDEO 5V
VIDEO GND
COSMO SO
UN (COSMO SCK)
UN (SYSTEM RESET)
COMP SYNC
JOG VD
UN (REC LED)
AUDIO 5V
AUDIO GND
EVF W
FADER
S/S 5V
S/S GND
UN (TALLY)
EVF 5V
EVF GND
UN (EDIT)
UN (DEW LED)
ME/UN (HP)
TO VS-67 BOARD (2/3) (VIDEO)
(See Page 155)
Q643 XN4210 1/2
Q643 XN4210 2/2
(D-14) (E-14) Q643, 644 SWITCH
Q644 DTA144EU
Q645 (D-14) INVERTER
Q645 DTC144EU
(C-14) D605 MA110
L602 47UH MURATA
(E-15) Q664, 665 (E-15) INVERTER
(E-11) D606 MA110
X501 5.85938MHz
JL587 CUE/REV
JL586 CLOG
JL588
JL589
(See Page 121)
W604 16P
FP-184 (FLEXIBLE), CN604
TO VC-80 BOARD (3/4) CAM3 (AF, FC) CN802
1 S/S 5V
2 EVER 5V
3 FADER CONT
4 N.C.
5 UN (COSMO CS)
6 UN (DDS SCK)
7 DDS SO
8 DDS SI
9 UN (SYSTEM RESET)
10 UN (CAM ADJ)
11 SERIAL CONT
12 EVF W
13 UN (ZOOM T)
14 UN (ZOOM W)
15 UN (EDIT SW)
16 S/S GND

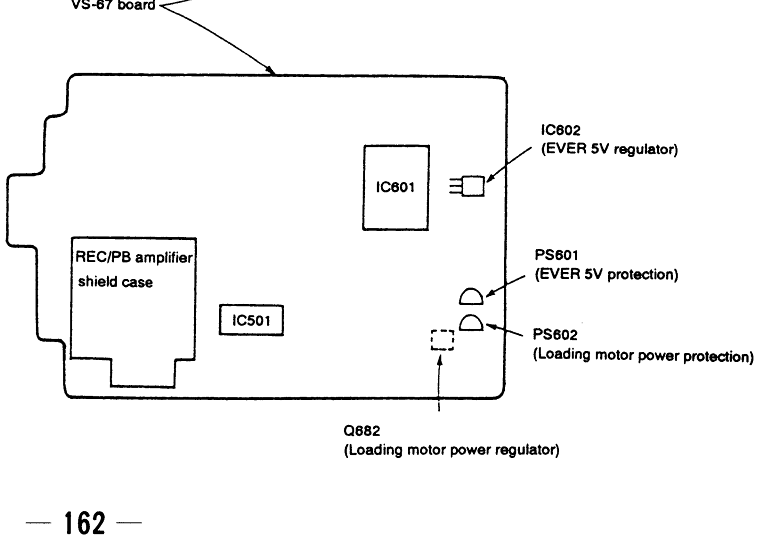

IC607 (E-10)
μPC393G2
①-③ CLOG DET
⑤-⑦ CUE/REV SP/LP DET
IC505 CXA1204Q
Q661 (F-16) PB RF AMP
Q662 (E-10) ENVELOPE DET
Q663 (F-10)
Q542 (F-9) REC ATF LPF
Q543 (E-9) REC ATF LPF
JL561
JL559
JL562
JL563
JL564
JL569
JL571
JL570
JL565
L503 100UH MURATA
L502 330UH

VS-67BOARD (3/3) SERVO SYSTEM CONTROL

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
✱ : can not be measured

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

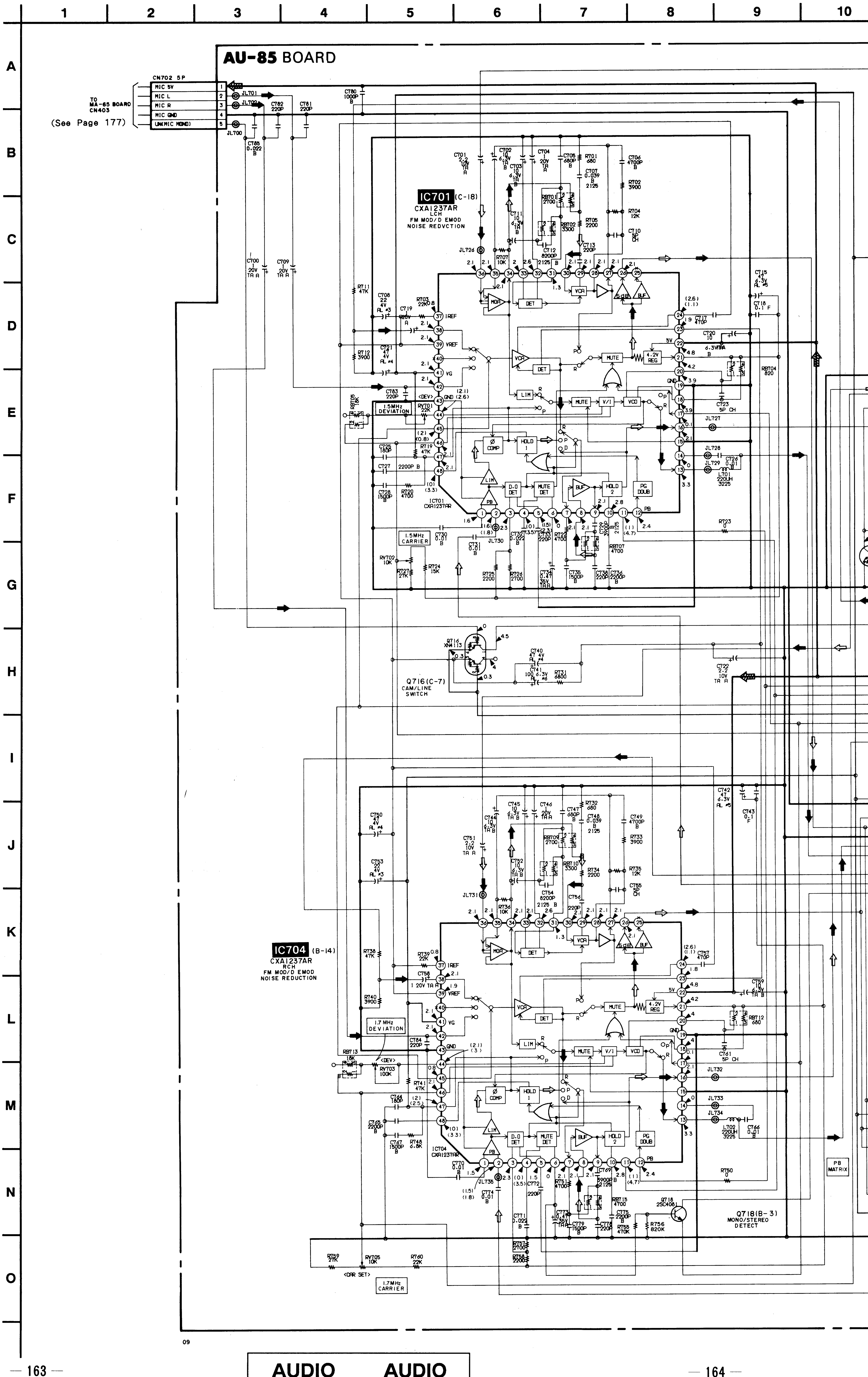

DD-30 board
(DC-DC converter,
drum/capstan error power amplification)
Battery terminal
IC LINK are housed.
PS901 (CAM UNREG protection)
PS902 (MOTOR UNREG protection)
PS903 (VTR UNREG protection)


VS-67 board
IC801
IC802
(EVER 5V regulator)
REC/PB amplifier
shield case
IC501
PS601
(EVER 5V protection)
PS602
(Loading motor power protection)
Q882
(Loading motor power regulator)

AU-85 (AFM STEREO PROCESS), AU-86 (OUTPUT SELECT, HEADPHONES AMP) SCHEMATIC DIAGRAMS

— Ref. No. AU-85, AU-86 BOARDS: 6000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.



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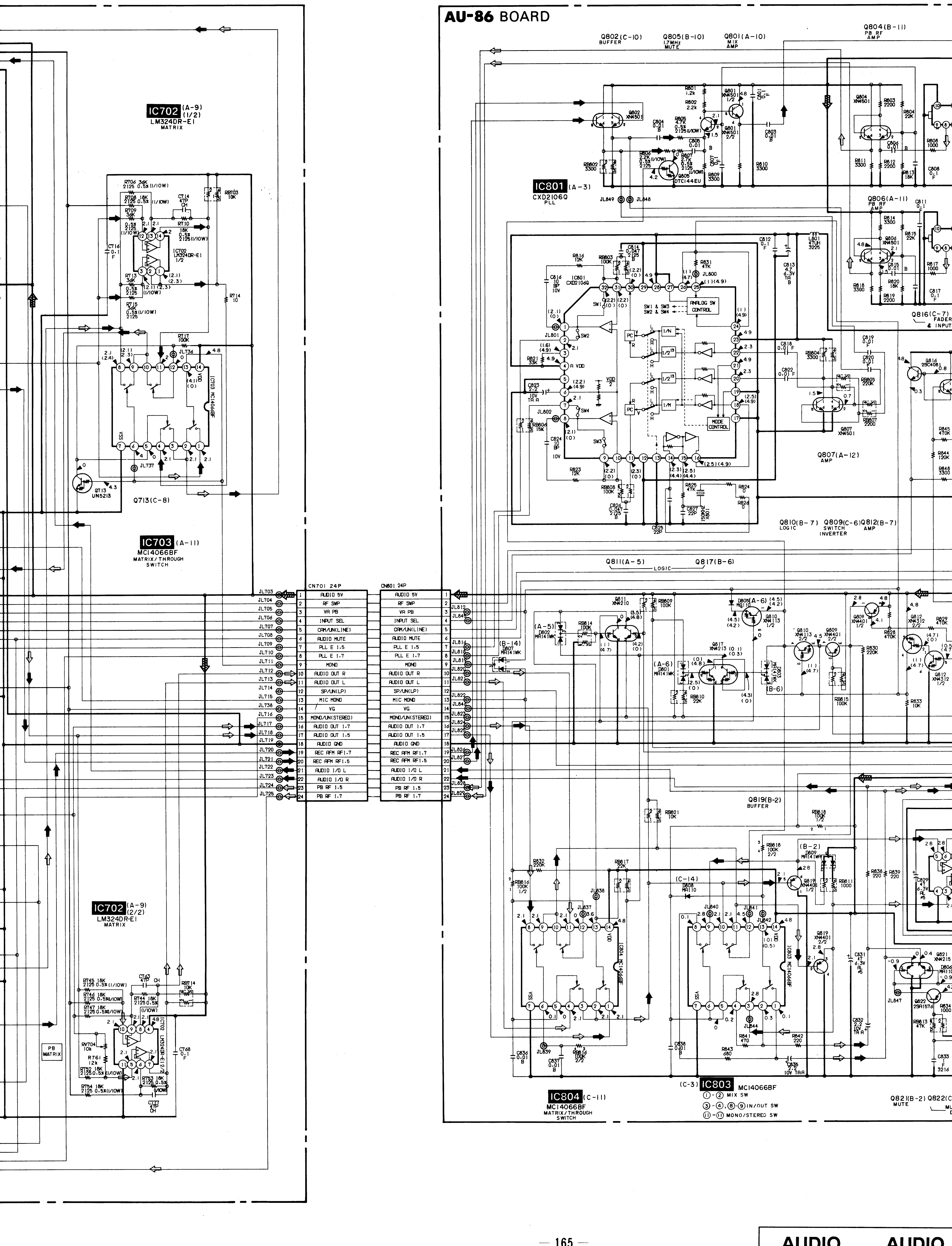
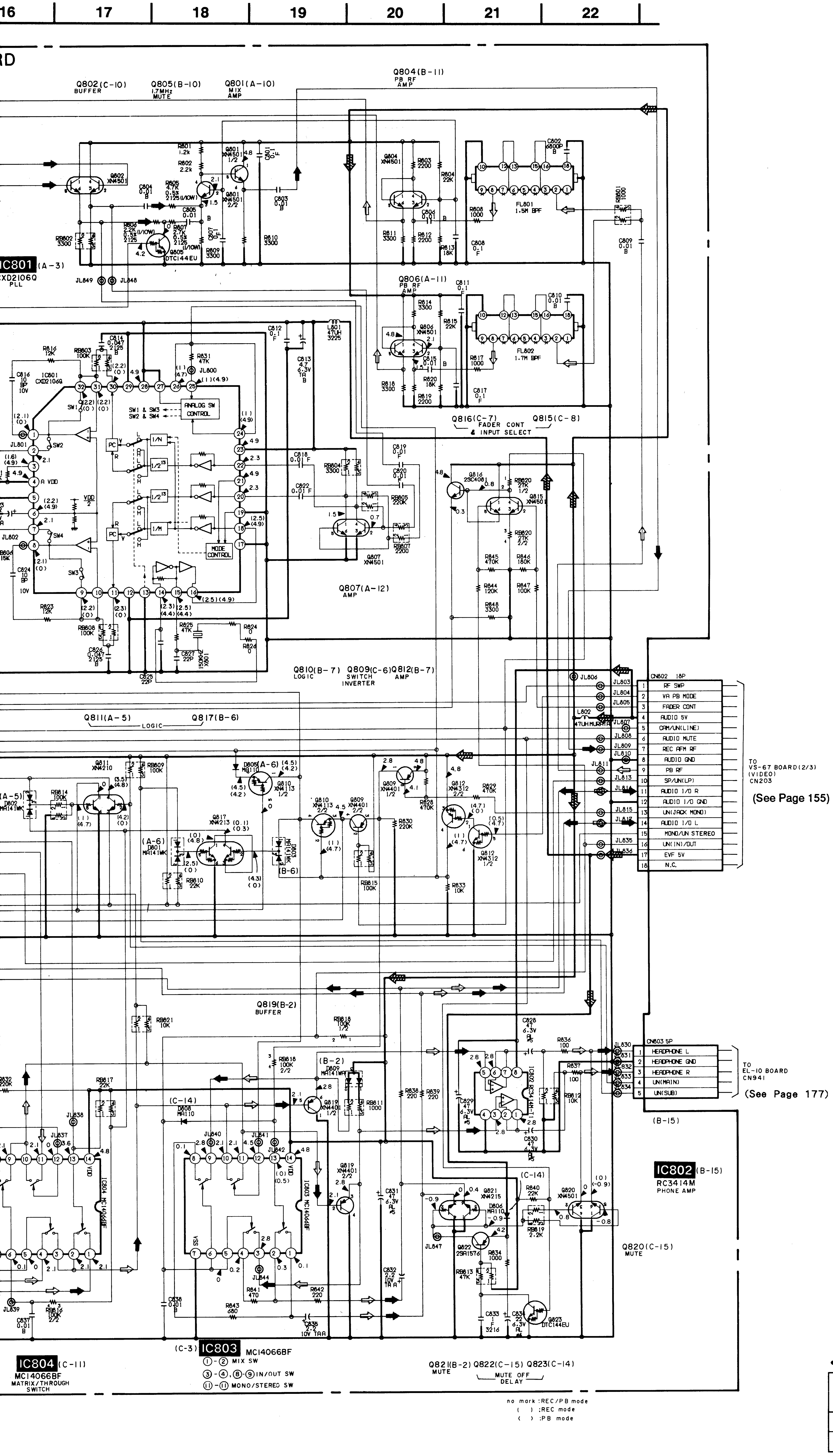
M
N
O
AU-85 BOARD
CN702 5P
MIC 5V
MIC L
MIC R
MIC GND
UN(MIC MONO)
TO MA-65 BOARD CN403
(See Page 177)
JL701
JL702
JL700
C780 1000P B
C782 220P
C781 220P
C785 0.022 B
C700 1 20V TA A
C709 1 20V TA A
IC701 (C-18)
CXA1237AR
LCH
FM MOD/D EMOD
NOISE REDVCTION
JL726
R711 47K
C708 22 4V AL #3
C719
R703 22K
R712 3900
C721 47 4V AL #4
C783 220P
1.5MHz DEVIATION
RV701 22K
RB705 15K
C726 180P
R719 47K
C727
2200P B
C728 1500P B
R720 4700
IC701 CXA1237AR
1.5MHz CARRIER
C730 0.01 B
C731 0.01 B
JL730
RV702 10K
R727 27K
R724 15K
R725 2200
R726 2700
C734 0.47 35V TA B
C735 1500P
C738 220P
C736 2200P B
RB707 4700
C701 2.2 10V TA A
C702 10 6.3V TA B
C703 10 6.3V TA B
C704 1 20V TA A
C705 680P B
R701 680
C706 4700P B
C707 0.039 B 2125
R702 3900
RB701 2700
RB702 3300
R704 12K
R705 2200
C710 5P CH
C711 10 6.3V TA B
C712 8200P 2125 B
C713 220P
R707 10K
MOD
DET
VCA
SCF
BUF
IREF
VREF
VG
DEV
GND
MUTE
REG
4.2V REG
LIM
V/I
VCO
Ø COMP
HOLD 1
HOLD 2
D.O DET
MUTE DET
PG DOUB
PB
C715 47 6.3V AL #5
C718 0.1 F
C717 470P
C720 10 6.3V TA B
RB704 820
C723 5P CH
JL727
JL728
JL729
C724 0.01
L701 220UH 3225
R723 0
R716 XN4113
Q716 (C-7)
CAM/LINE SWITCH
C740 47 4V AL #4
C741 100 6.3V AL #6
R731 6800
C722 2.2 10V TA A
C742 47 6.3V AL #5
C743 0.1 F
IC704 (B-14)
CXA1237AR
RCH
FM MOD/D EMOD
NOISE REDUCTION
C750 47 4V AL #4
C753 22 4V AL #3
C751 2.2 10V TA A
JL731
C745 10 6.3V TA B
C746 1 20V TA B
C747 680P B
R732 680
C748 0.039 B 2125
C749 4700P B
R733 3900
RB709 2700
RB710 3300
R734 2200
R735 12K
C755 5P CH
C752 10 6.3V TA B
C754 8200P 2125 B
C756 220P
R736 10K
R738 47K
R739 22K
C758 1 20V TA A
R740 3900
1.7MHz DEVIATION
C784 220P
RB713 18K
RV703 100K
R741 47K
C764 180P
C765 2200P B
C767 1500P B
R748 6.8K
IC704 CXA1237AR
C770 0.01 B
JL735
C774 0.01 B
C771 0.022 B
C772 220P
C773 0.47 35V TA B
C779 1500P B
R751 4700
C769 3900P B 2125
RB715 4700
C776 220P
C775 2200P B
R755 470K
R756 820K
R757 2700
R754 2200
Q718 2SC4081
Q718 (B-3)
MONO/STEREO DETECT
C757 470P
C759 10 6.3V TA B
RB712 680
C761 5P CH
JL732
JL733
JL734
L702 220UH 3225
C766 0.01
R750 0
PB MATRIX
R759 27K
RV705 10K
R760 22K
<CAR SET>
1.7MHz CARRIER
09

AUDIO AUDIO


AU-86 BOARD
IC702 (A-9) (1/2) LM324DR-E1 MATRIX
IC703 (A-11) MC14066BF MATRIX/THROUGH SWITCH
Q713 UN5213
Q713(C-8)
IC702 (A-9) (2/2) LM324DR-E1 MATRIX
PB MATRIX
IC801 (A-3) CXD2106Q PLL
Q802(C-10) BUFFER
Q805(B-10) 1.7MHz MUTE
Q801(A-10) MIX AMP
Q804(B-11) PB RF AMP
Q806(A-11) PB RF AMP
Q816(C-7) FADER & INPUT
Q807(A-12) AMP
Q810(B-7) LOGIC
Q809(C-6) SWITCH INVERTER
Q812(B-7) AMP
Q811(A-5) LOGIC Q817(B-6)
Q819(B-2) BUFFER
ANALOG SW CONTROL
MODE CONTROL
SW1 & SW3 SW2 & SW4
CN701 24P
CN801 24P
1 AUDIO 5V
2 RF SWP
3 VA PB
4 INPUT SEL
5 CAM/LN(LINE)
6 AUDIO MUTE
7 PLL E 1.5
8 PLL E 1.7
9 MONO
10 AUDIO OUT R
11 AUDIO OUT L
12 SP/LN(LP)
13 MIC MONO
14 VG
15 MONO/LN(STEREO)
16 AUDIO OUT 1.7
17 AUDIO OUT 1.5
18 AUDIO GND
19 REC AFM RF1.7
20 REC AFM RF1.5
21 AUDIO I/O L
22 AUDIO I/O R
23 PB RF 1.5
24 PB RF 1.7
IC804 (C-11) MC14066BF MATRIX/THROUGH SWITCH
(C-3) IC803 MC14066BF
①-② MIX SW
③-④,⑧-⑨ IN/OUT SW
⑩-⑪ MONO/STEREO SW
Q821(B-2) MUTE Q822(C


16
17
18
19
20
21
22
RD
Q802(C-10) BUFFER
Q805(B-10) 1.7MHz MUTE
Q801(A-10) MIX AMP
Q804(B-11) PB RF AMP
FL801 1.5M BPF
FL802 1.7M BPF
IC801 (A-3) CXD2106Q PLL
Q806(A-11) PB RF AMP
ANALOG SW CONTROL
MODE CONTROL
Q816(C-7) FADER CONT & INPUT SELECT
Q815(C-8)
Q807(A-12) AMP
Q810(B-7) LOGIC
Q809(C-6) SWITCH INVERTER
Q812(B-7) AMP
Q811(A-5) LOGIC
Q817(B-6)
CN802 18P
1 RF SWP
2 VA PB MODE
3 FADER CONT
4 AUDIO 5V
5 CAM/UN(LINE)
6 AUDIO MUTE
7 REC AFM RF
8 AUDIO GND
9 PB RF
10 SP/UN(LP)
11 AUDIO I/O R
12 AUDIO I/O GND
13 UN(JACK MONO)
14 AUDIO I/O L
15 MONO/UN STEREO
16 UN(IN)/OUT
17 EVF 5V
18 N.C.
TO VS-67 BOARD(2/3) (VIDEO) CN203
(See Page 155)
Q819(B-2) BUFFER
CN803 5P
1 HEADPHONE L
2 HEADPHONE GND
3 HEADPHONE R
4 UN(MAIN)
5 UN(SUB)
TO EL-10 BOARD CN941
(See Page 177)
(B-15)
IC802 (B-15) RC3414M PHONE AMP
Q820(C-15) MUTE
IC803 (C-3) MC14066BF
①-② MIX SW
③-④,⑧-⑨ IN/OUT SW
⑪-⑪ MONO/STEREO SW
IC804 (C-11) MC14066BF MATRIX/THROUGH SWITCH
Q821(B-2) MUTE
Q822(C-15) Q823(C-14) MUTE OFF DELAY
no mark :REC/PB mode
( ) :REC mode
( ) :PB mode

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				➡
PB				⇨

AU-85 (AFM STEREO PROCESS), AU-86 (OUTPUT SELECT, HEADPHONES AMP) PRINTED WIRING BOARDS

— Ref. No. AU-85, AU-86 BOARDS: 6000 series —

- **For printed wiring boards.**
- AU-85, AU-86 boards is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

AU-85 BOARD
****

IC

IC701	8-752-033-01	IC CXA1237AR
IC702	8-759-100-95	IC UPC324G2
IC703	8-759-932-54	IC MC14066BF
IC704	8-752-033-01	IC CXA1237AR

TRANSISTOR

Q713	8-729-402-42	TRANSISTOR UN5213
Q716	8-729-421-90	TRANSISTOR XN4113
Q718	8-729-117-32	TRANSISTOR 2SC4177

AU-86 BOARD
****

DIODE

D801	8-719-404-35	DIODE MA141WK
D802	8-719-404-35	DIODE MA141WK
D803	8-719-404-35	DIODE MA141WK
D805	8-719-404-46	DIODE MA110
D806	8-719-404-46	DIODE MA110
D807	8-719-404-35	DIODE MA141WK
D808	8-719-404-46	DIODE MA110
D809	8-719-404-32	DIODE MA141WA

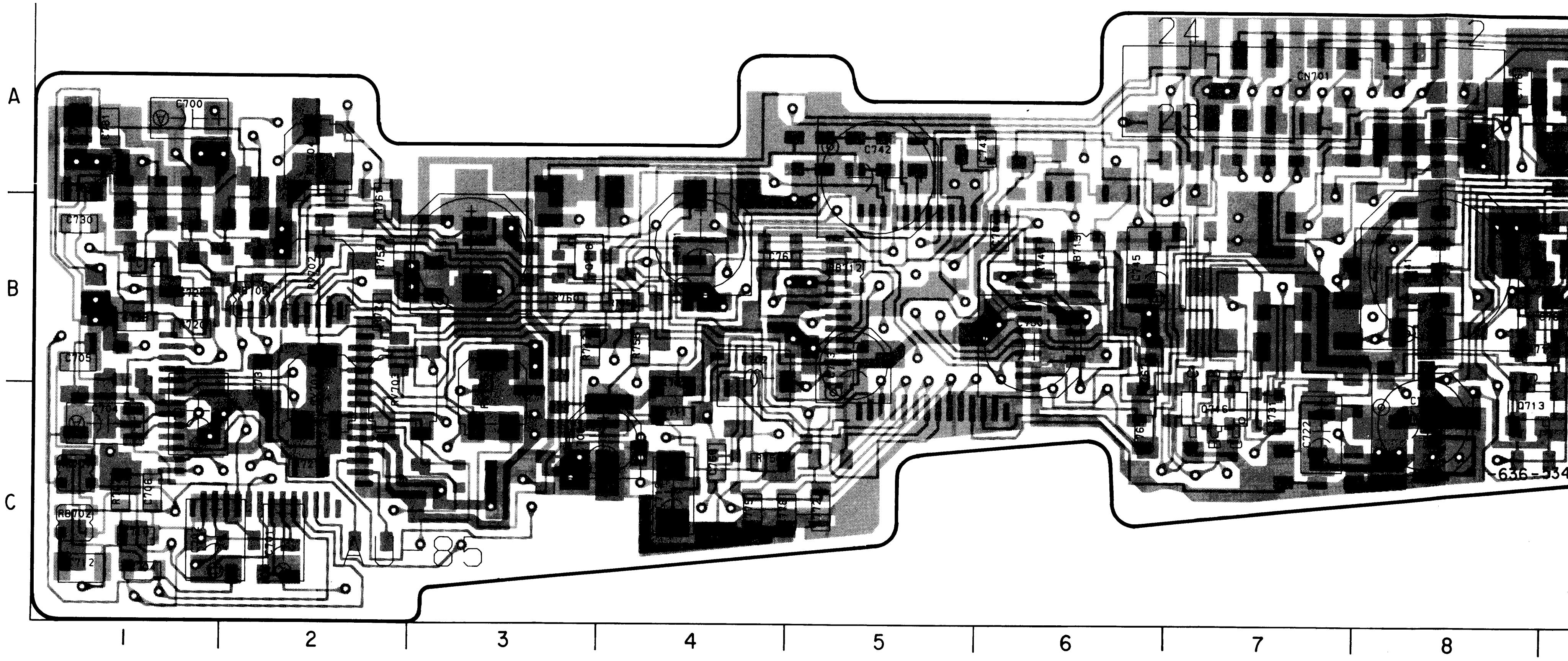
IC

IC801	8-752-334-42	IC CXD2106Q
IC802	8-759-981-82	IC RC3414M
IC803	8-759-932-54	IC MC14066BF
IC804	8-759-932-54	IC MC14066BF

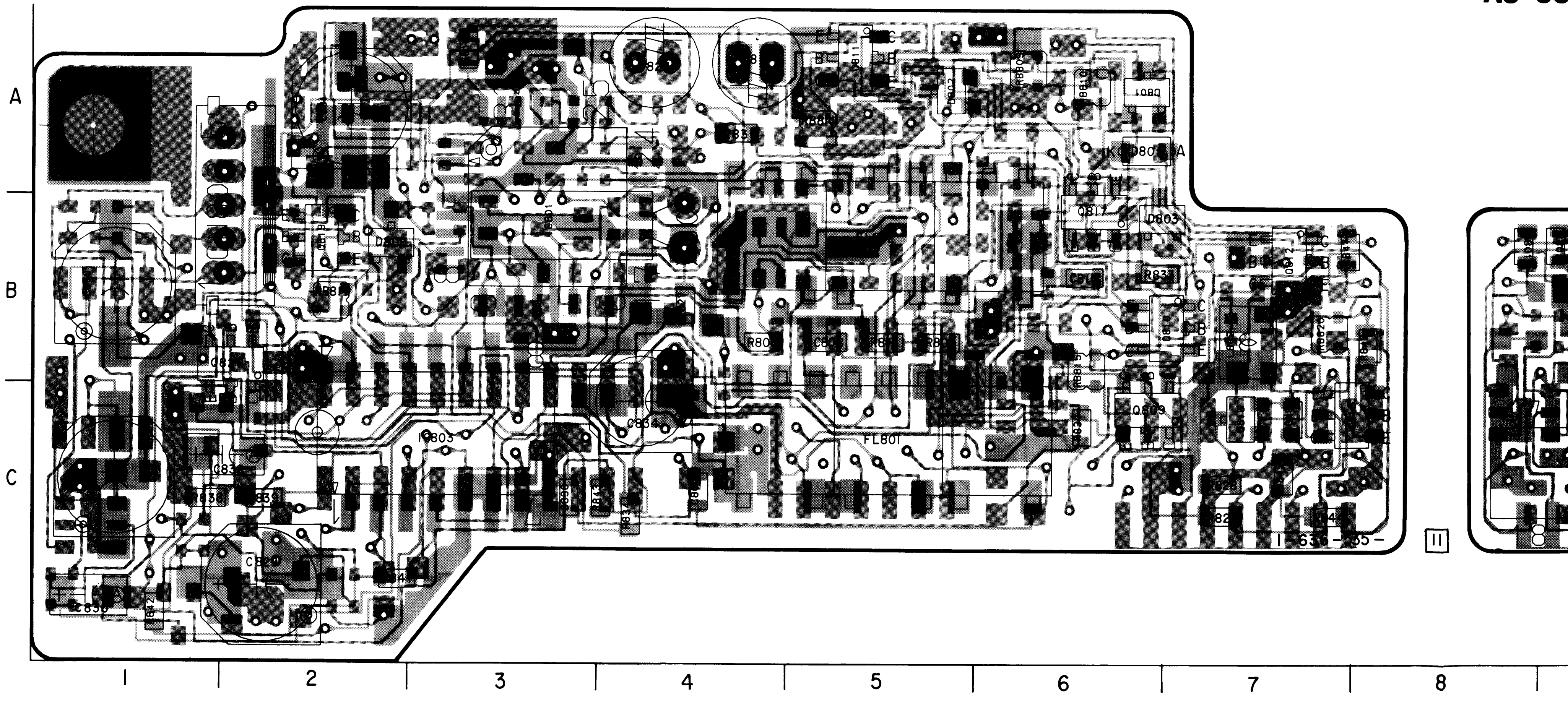
TRANSISTOR

Q801	8-729-402-81	TRANSISTOR XN4501
Q802	8-729-402-81	TRANSISTOR XN4501
Q804	8-729-402-81	TRANSISTOR XN4501
Q805	8-729-402-42	TRANSISTOR UN5213
Q806	8-729-402-81	TRANSISTOR XN4501
Q807	8-729-402-81	TRANSISTOR XN4501
Q809	8-729-403-27	TRANSISTOR XN4401
Q810	8-729-421-90	TRANSISTOR XN4113
Q811	8-729-403-24	TRANSISTOR XN4210
Q812	8-729-420-20	TRANSISTOR XN4312
Q815	8-729-402-81	TRANSISTOR XN4501
Q816	8-729-117-32	TRANSISTOR 2SC4177
Q817	8-729-420-12	TRANSISTOR XN4213
Q819	8-729-403-27	TRANSISTOR XN4401
Q820	8-729-402-81	TRANSISTOR XN4501
Q821	8-729-422-54	TRANSISTOR XN4215
Q822	8-729-140-63	TRANSISTOR 2SA1611-M5M6
Q823	8-729-402-42	TRANSISTOR UN5213

AU-85 BOARD (COMPONENT SIDE)

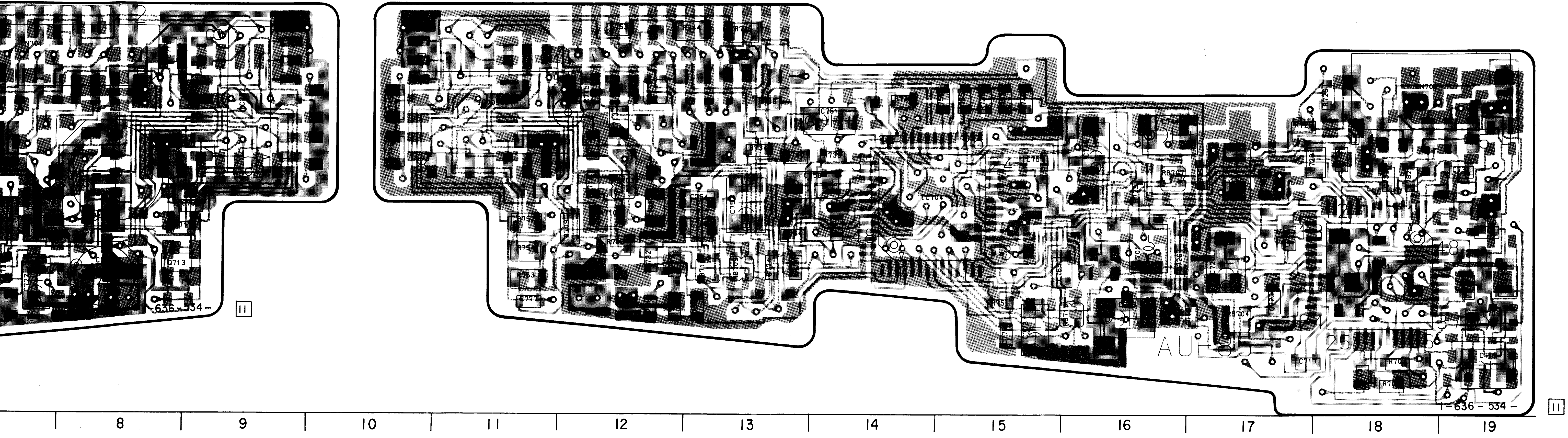


AU-86 BOARD (COMPONENT SIDE)

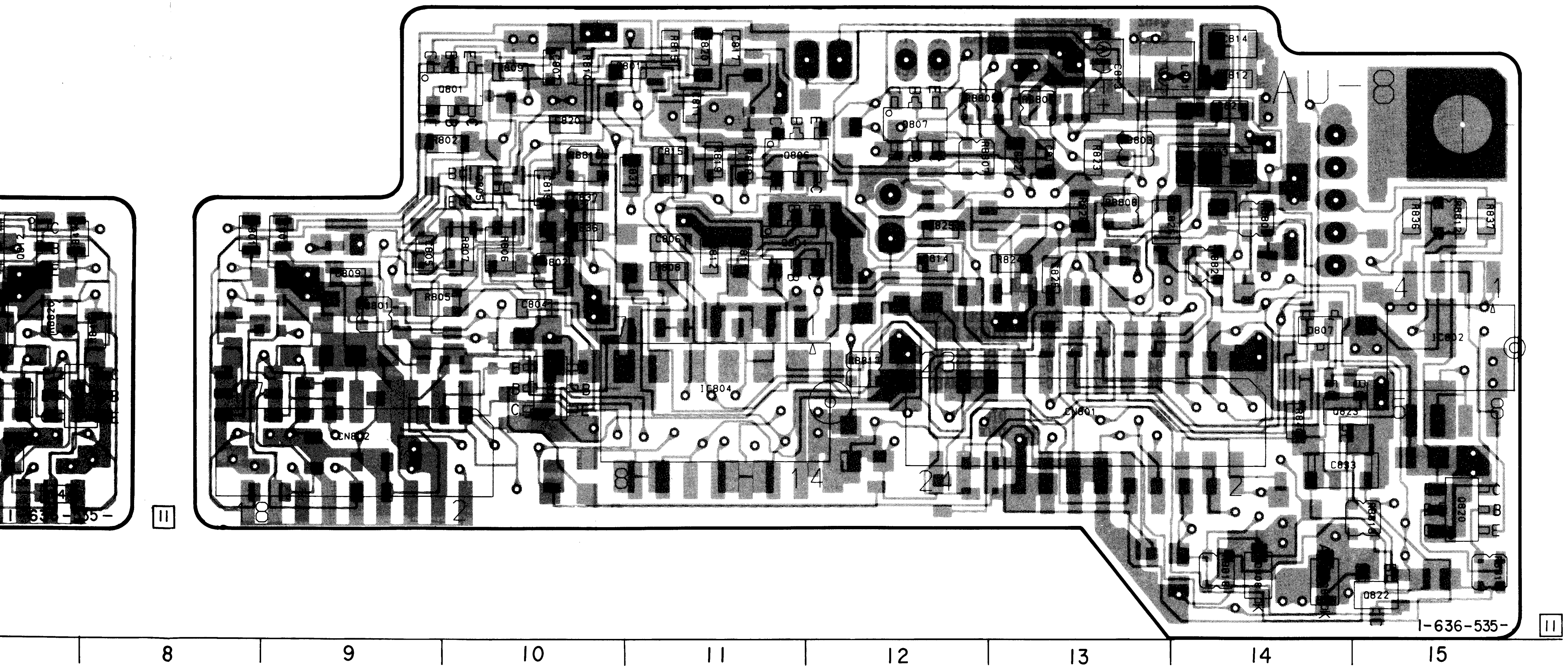


AU-86

AU-85 BOARD (CONDUCTOR SIDE)


1-636-534-
II
AU-85
IC704
IC701
1-636-534-
II
8
9
10
11
12
13
14
15
16
17
18
19

AU-86 BOARD (CONDUCTOR SIDE)


AU-86
IC804
IC802
CN801
CN802
1-636-535-
II
1-636-535-
II
8
9
10
11
12
13
14
15

MA-65 (MIC AMP), EL-10 (HEADPHONES/REMOTE JACK) PRINTED WIRING BOARDS

— Ref. No. MA-65, EL-10 BOARDS: 7000 series —

- **For printed wiring boards.**
- MA-65 and EL-10 boards is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

MA-65 BOARD
****

DIODE

D401	8-719-404-46	DIODE MA110

TRANSISTOR

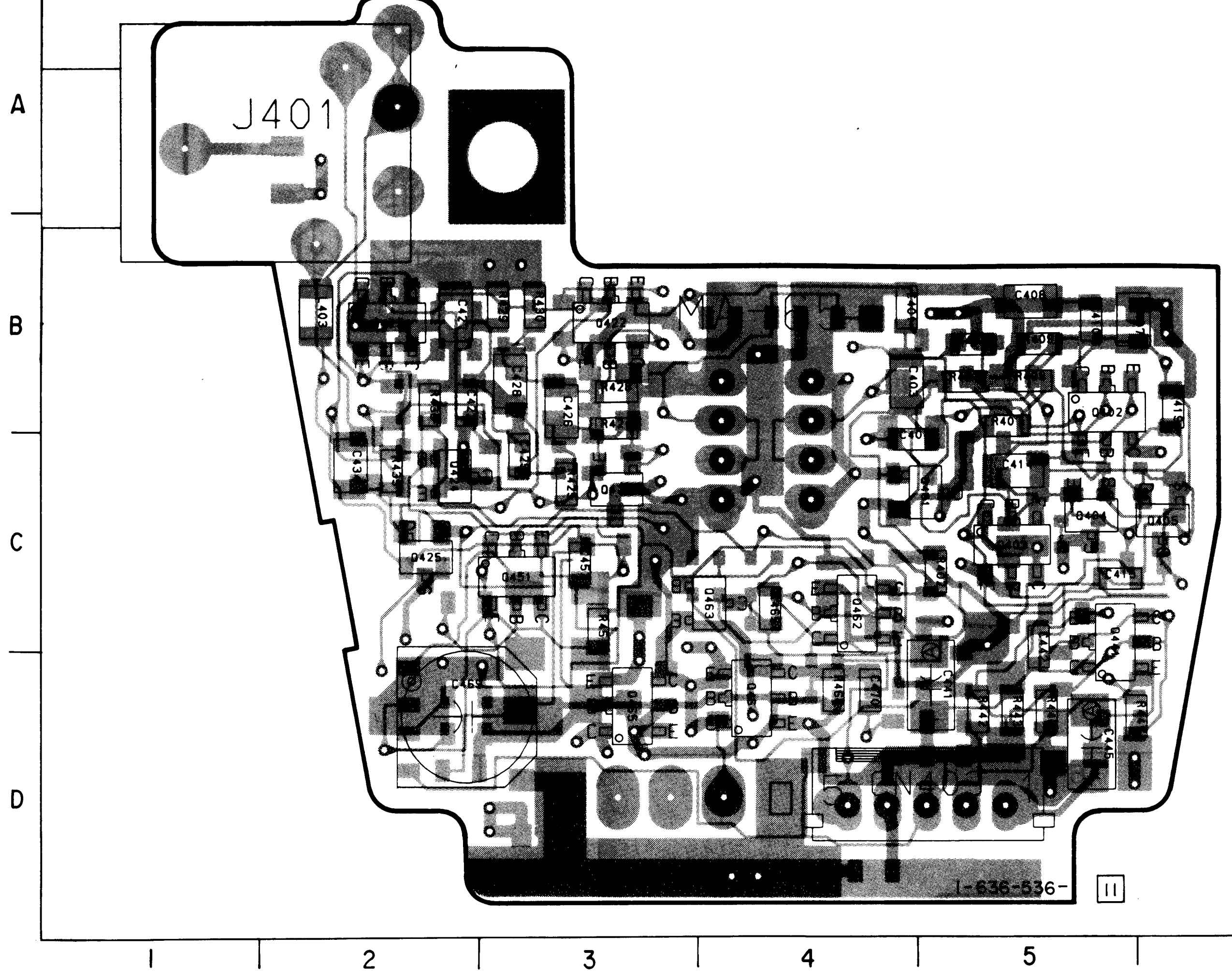
Q401	8-729-905-35	TRANSISTOR 2SC4081R
Q402	8-729-822-48	TRANSISTOR FC101
Q403	8-729-822-48	TRANSISTOR FC101
Q404	8-729-905-35	TRANSISTOR 2SC4081R
Q405	8-729-821-88	TRANSISTOR 2SK1332-3
Q421	8-729-905-35	TRANSISTOR 2SC4081R
Q422	8-729-822-48	TRANSISTOR FC101
Q423	8-729-822-48	TRANSISTOR FC101
Q424	8-729-905-35	TRANSISTOR 2SC4081R
Q425	8-729-821-88	TRANSISTOR 2SK1332-3
Q441	8-729-822-48	TRANSISTOR FC101
Q451	8-729-822-48	TRANSISTOR FC101
Q461	8-729-822-94	TRANSISTOR FC102
Q462	8-729-822-94	TRANSISTOR FC102
Q463	8-729-905-12	TRANSISTOR DTA144EU
Q464	8-729-822-94	TRANSISTOR FC102
Q465	8-729-822-94	TRANSISTOR FC102

EL-10 BOARD
****

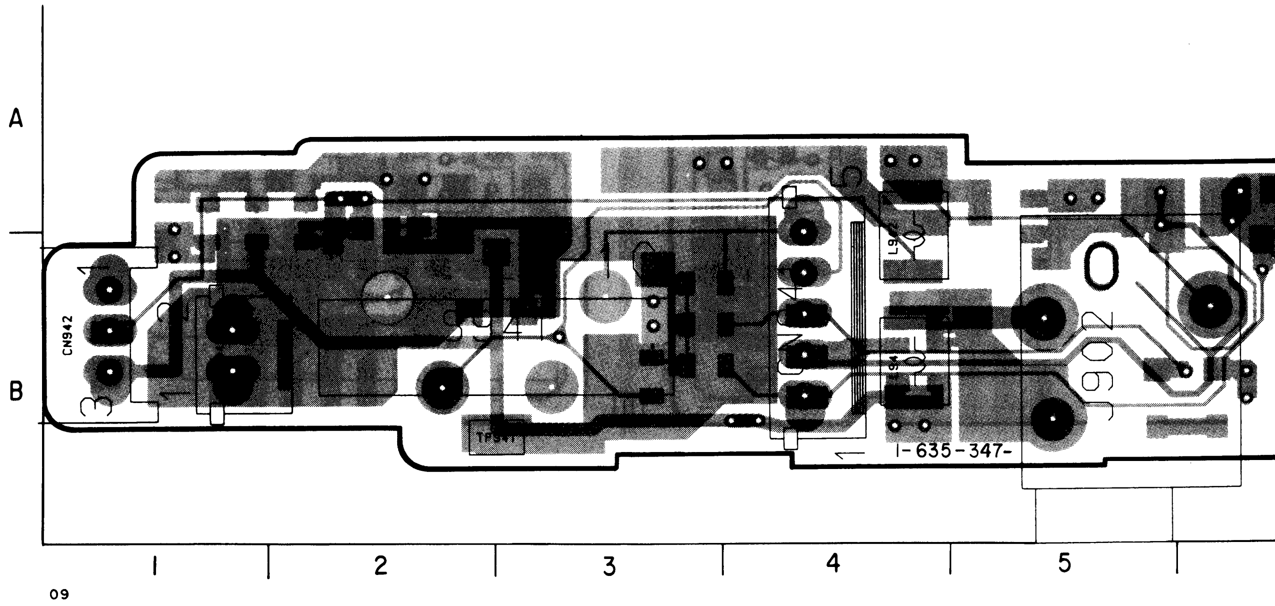
DIODE

D941	8-719-420-15	DIODE MA8082-M
D942	8-719-106-71	DIODE RD12M-B2
D943	8-719-941-86	DIODE DAN202U
D944	8-719-420-15	DIODE MA8082-M
D945	8-719-420-15	DIODE MA8082-M
D946	8-719-420-15	DIODE MA8082-M
D947	8-719-420-15	DIODE MA8082-M

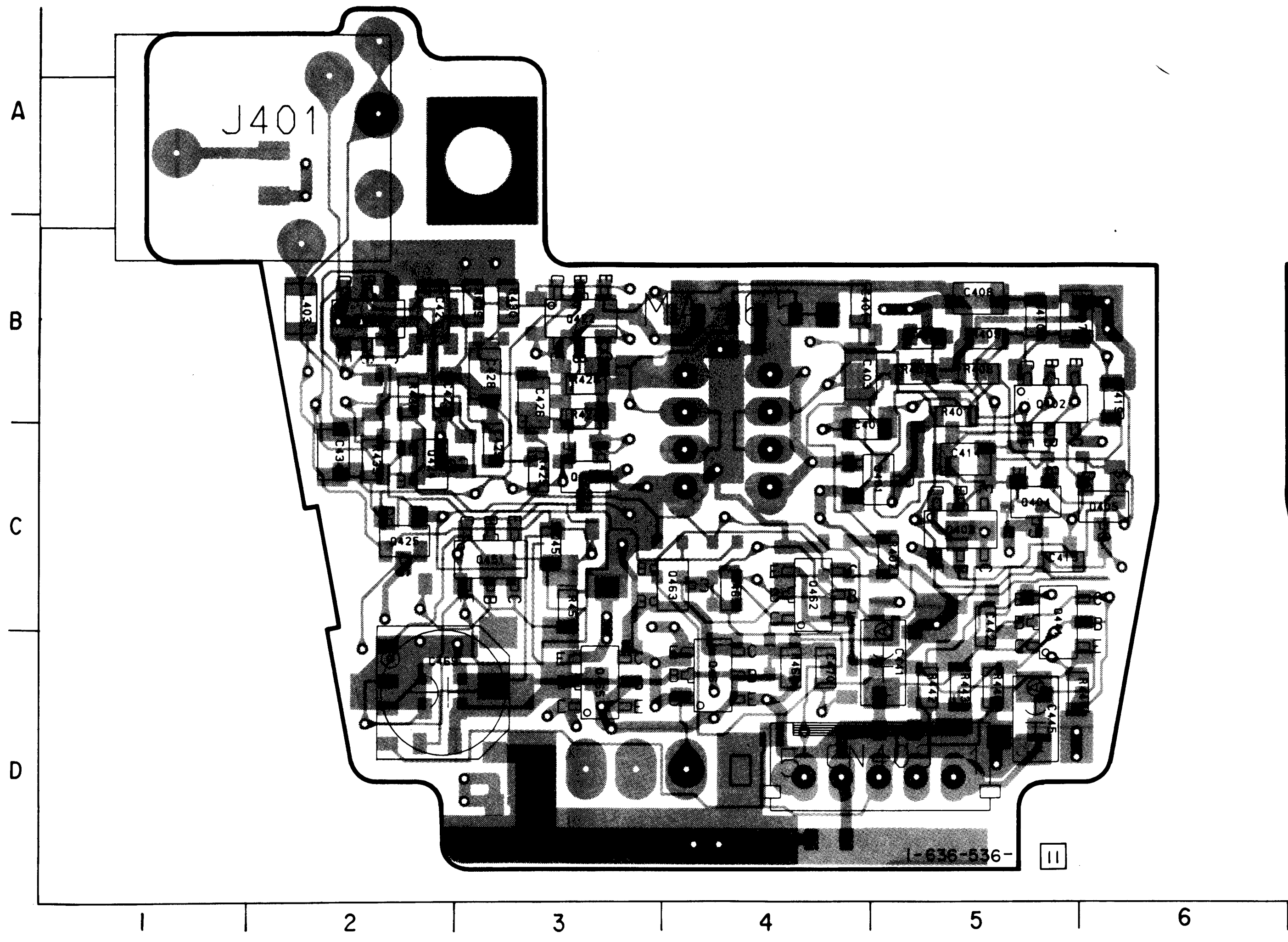
MA-65 BOARD (COMPONENT SIDE)



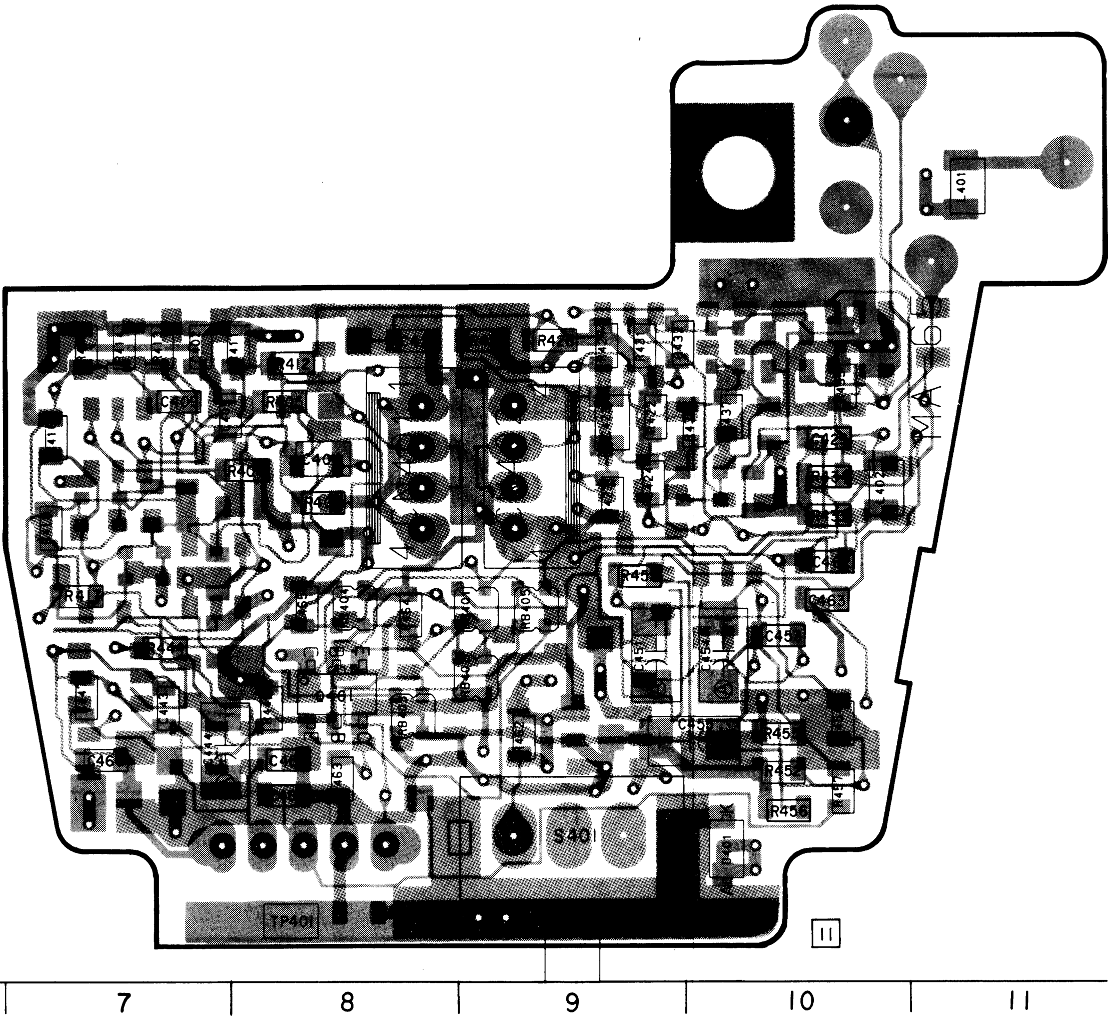
EL-10 BOARD (COMPONENT SIDE)



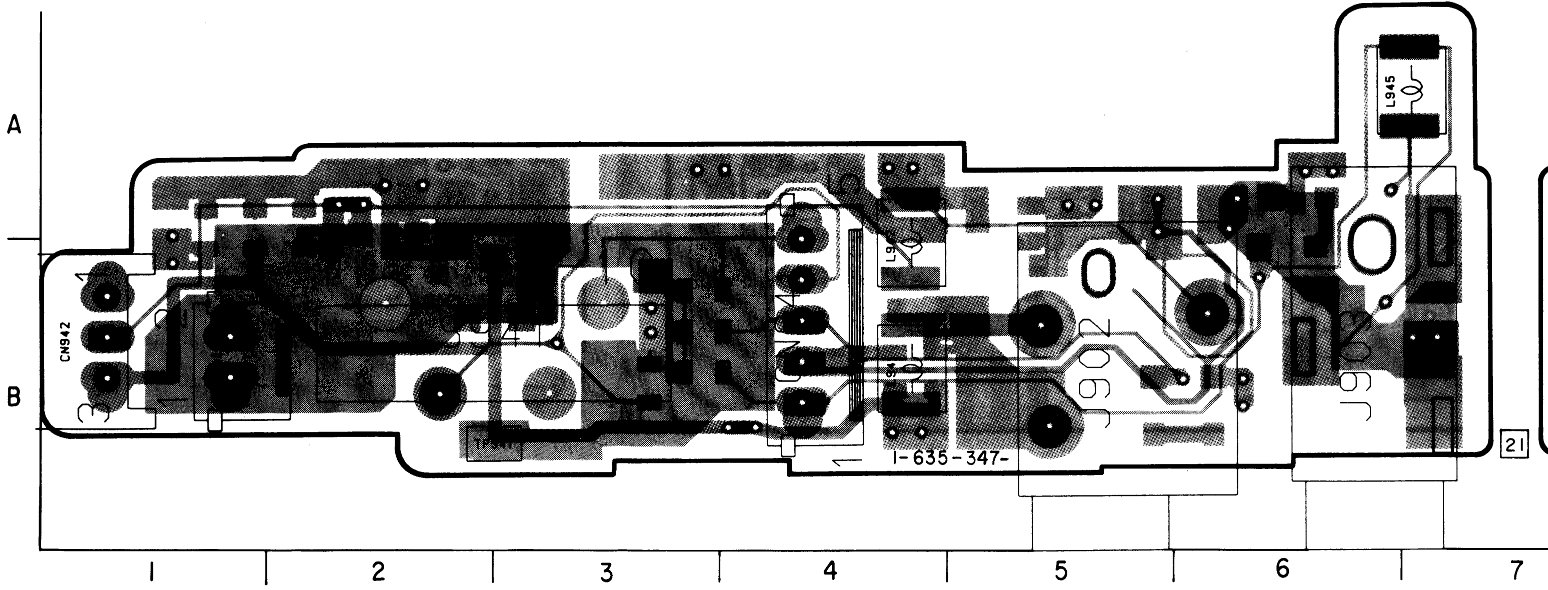
MA-65 BOARD (COMPONENT SIDE)


A
B
C
D
J401
1-636-536-
11
1
2
3
4
5
6

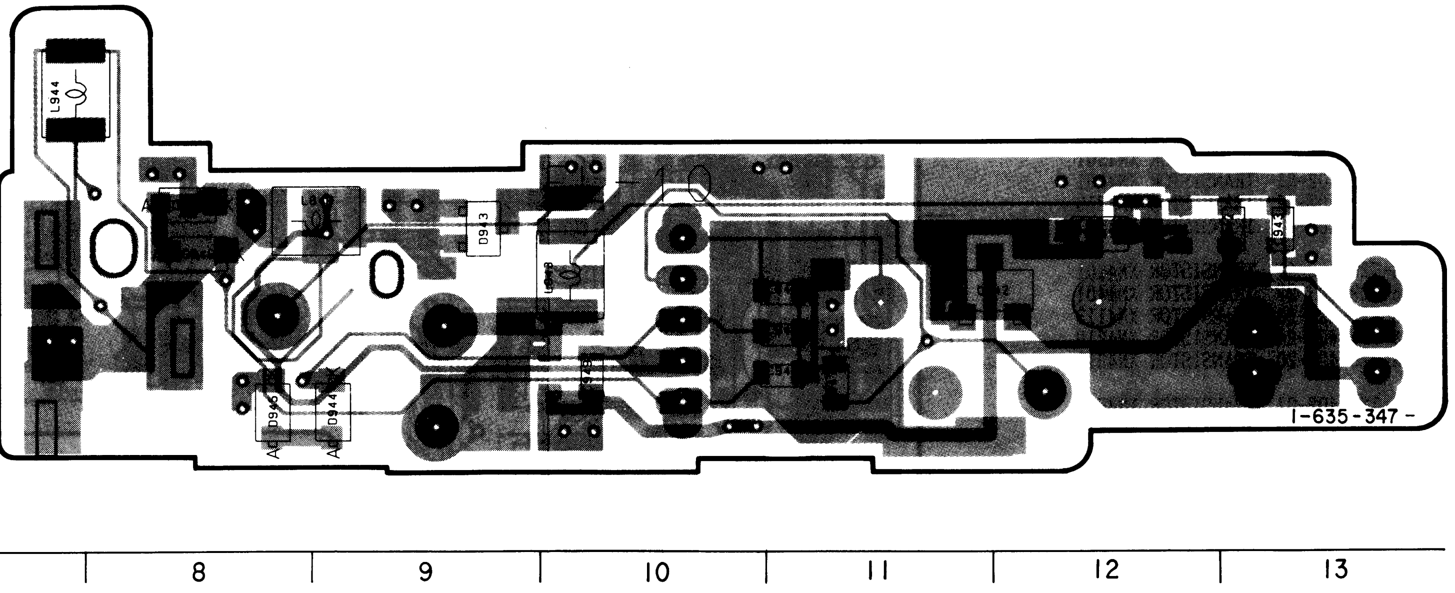
MA-65 BOARD (CONDUCTOR SIDE)


S401
TP401
11
7
8
9
10
11

EL-10 BOARD (COMPONENT SIDE)


A
B
CN942
L945
J902
TP941
1-635-347-
21
1
2
3
4
5
6
7

EL-10 BOARD (CONDUCTOR SIDE)

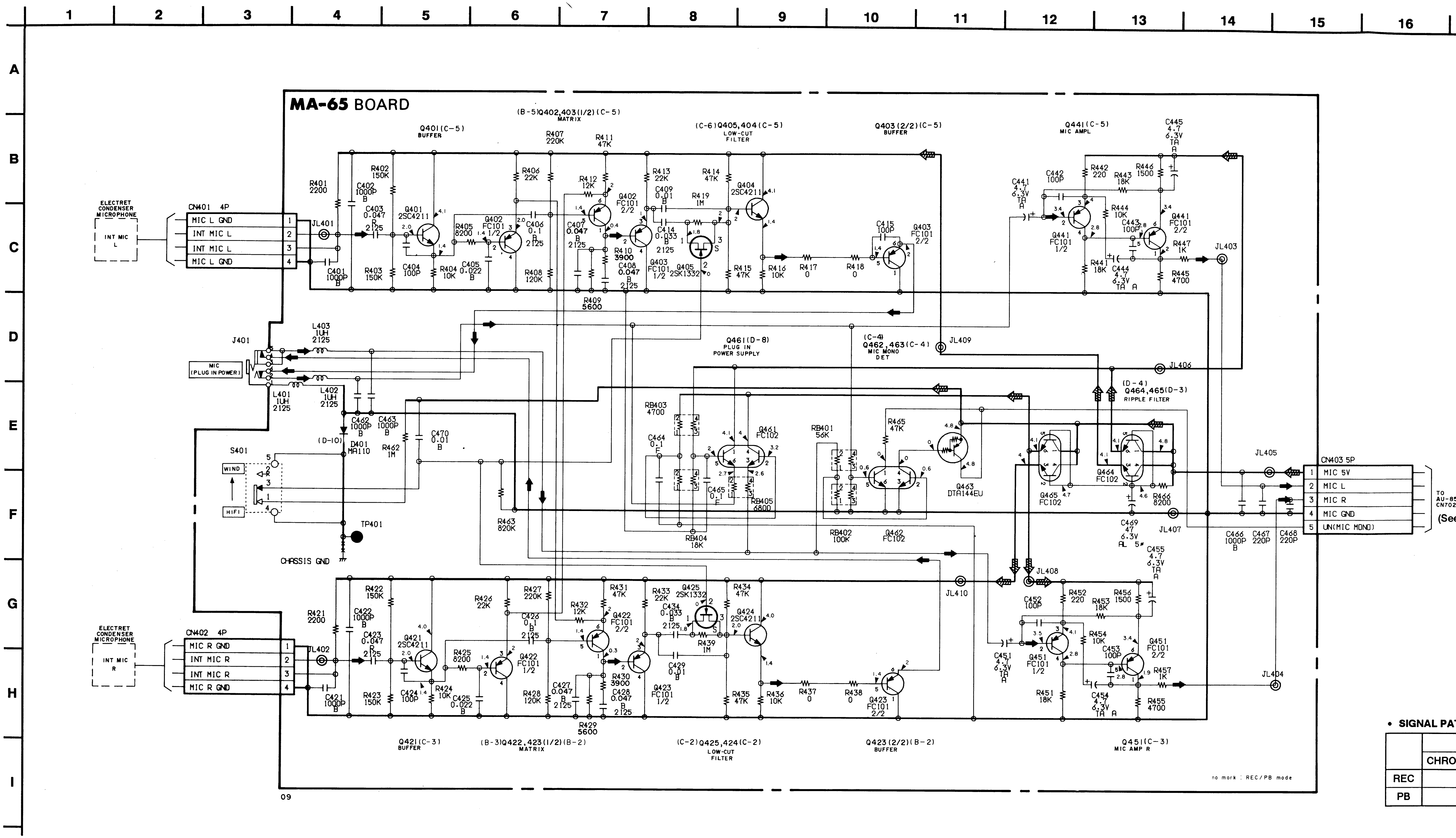

L944
D943
D945
D944
1-635-347-
21
8
9
10
11
12
13

MA-65 (MIC AMP), EL-10 (HEADPHONES/REMOTE JACK) SCHEMATIC DIAGRAMS

— Ref. No. MA-65, EL-10 BOARDS: 7000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

http://www.manualscenter.com



MA-65 BOARD
ELECTRET CONDENSER MICROPHONE
INT MIC L
CN401 4P
MIC L GND
INT MIC L
INT MIC L
MIC L GND
JL401
R401 2200
R402 150K
C402 1000P B
C403 0.047 2125
C401 1000P B
R403 150K
Q401(C-5) BUFFER
Q401 2SC4211
C404 100P
R404 10K
R405 8200
C405 0.022 B
(B-5)Q402,403(1/2)(C-5) MATRIX
Q402 FC101 1/2
R406 22K
R407 220K
C406 0.1 B 2125
R408 120K
R411 47K
R412 12K
Q402 FC101 2/2
C407 0.047 B 2125
R409 5600
R410 3900
C408 0.047 B 2125
Q403 FC101 1/2
(C-6)Q405,404(C-5) LOW-CUT FILTER
R413 22K
C409 0.01 B
C414 0.033 B 2125
R419 1M
Q405 2SK1332
R414 47K
Q404 2SC4211
R415 47K
R416 10K
R417 0
R418 0
Q403(2/2)(C-5) BUFFER
C415 100P
Q403 FC101 2/2
Q441(C-5) MIC AMPL
C441 4.7 6.3V TA A
C442 100P
R442 220
R443 18K
R446 1500
C445 4.7 6.3V TA A
R444 10K
C443 100P
Q441 FC101 1/2
Q441 FC101 2/2
R447 1K
R441 18K
C444 4.7 6.3V TA A
R445 4700
JL403
J401
MIC (PLUG IN POWER)
L403 1UH 2125
L401 1UH 2125
L402 1UH 2125
C462 1000P B
C463 1000P B
C470 0.01 B
(D-10) D401 MA110
R462 1M
S401
WIND
HIFI
TP401
CHASSIS GND
R463 820K
Q461(D-8) PLUG IN POWER SUPPLY
RB403 4700
C464 0.1 F
Q461 FC102
C465 0.1 F
RB405 6800
RB404 18K
(C-4) Q462,463(C-4) MIC MONO DET
RB401 56K
R465 47K
Q463 DTA144EU
RB402 100K
Q462 FC102
JL409
JL406
(D-4) Q464,465(D-3) RIPPLE FILTER
Q465 FC102
Q464 FC102
R466 8200
C469 47 6.3V AL 5
JL407
JL405
JL408
C455 4.7 6.3V TA A
CN403 5P
1 MIC 5V
2 MIC L
3 MIC R
4 MIC GND
5 UN(MIC MONO)
C466 1000P B
C467 220P
C468 220P
TO AU-85 CN702
(See
ELECTRET CONDENSER MICROPHONE
INT MIC R
CN402 4P
MIC R GND
INT MIC R
INT MIC R
MIC R GND
JL402
R421 2200
R422 150K
C422 1000P B
C423 0.047 2125
C421 1000P B
R423 150K
Q421 2SC4211
C424 100P
R424 10K
R425 8200
C425 0.022 B
Q422 FC101 1/2
R426 22K
R427 220K
C426 0.1 B 2125
R428 120K
R431 47K
R432 12K
Q422 FC101 2/2
C427 0.047 B 2125
R429 5600
R430 3900
C428 0.047 B 2125
Q423 FC101 1/2
R433 22K
Q425 2SK1332
C434 0.033 B 2125
C429 0.01 B
R439 1M
R434 47K
Q424 2SC4211
R435 47K
R436 10K
R437 0
R438 0
Q423 FC101 2/2
JL410
C452 100P
R452 220
R453 18K
R456 1500
R454 10K
C451 4.7 6.3V TA A
Q451 FC101 1/2
C453 100P
Q451 FC101 2/2
R457 1K
R451 18K
C454 4.7 6.3V TA A
R455 4700
JL404
Q421(C-3) BUFFER
(B-3)Q422,423(1/2)(B-2) MATRIX
(C-2)Q425,424(C-2) LOW-CUT FILTER
Q423(2/2)(B-2) BUFFER
Q451(C-3) MIC AMP R
no mark : REC/PB mode
09

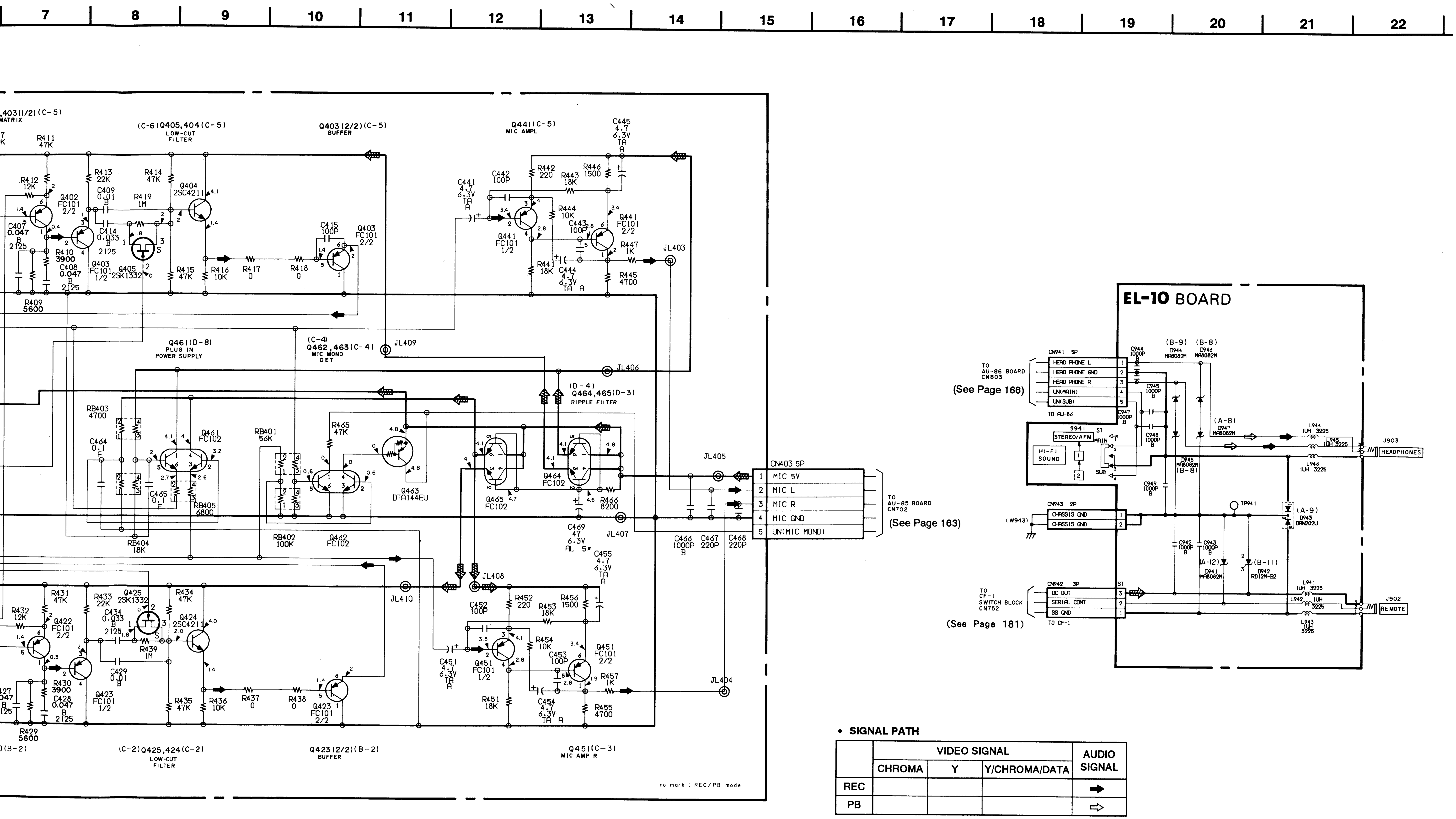
- **SIGNAL PA**

	CHRO
REC	
PB	

lc diagrams.

n like (C-9) for each semiconductor indicates the
ion address on the printed wiring board.

http://www.manualscenter.com


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
(C-6)Q405,404(C-5) LOW-CUT FILTER
Q403(2/2)(C-5) BUFFER
Q441(C-5) MIC AMPL
Q461(D-8) PLUG IN POWER SUPPLY
(C-4) Q462,463(C-4) MIC MONO DET
(D-4) Q464,465(D-3) RIPPLE FILTER
JL403
JL404
JL405
JL406
JL407
JL408
JL409
JL410
Q463 DTA144EU
Q464 FC102
Q465 FC102
Q462 FC102
Q461 FC102
RB401 56K
RB402 100K
RB403 4700
RB404 18K
RB405 6800
CN403 5P
1 MIC 5V
2 MIC L
3 MIC R
4 MIC GND
5 UN(MIC MONO)
TO AU-85 BOARD CN702
(See Page 163)
(C-2)Q425,424(C-2) LOW-CUT FILTER
Q423(2/2)(B-2) BUFFER
Q451(C-3) MIC AMP R
no mark : REC/PB mode
EL-10 BOARD
CN941 5P
HEAD PHONE L
HEAD PHONE GND
HEAD PHONE R
UN(MAIN)
UN(SUB)
TO AU-86
TO AU-86 BOARD CN803
(See Page 166)
S941 STEREO/AFM
HI-FI SOUND
ST MAIN SUB
J903 HEADPHONES
CN943 2P
CHASSIS GND
CHASSIS GND
(W943)
TP941
D943 DAN202U
D941 MA8082M
D942 RD12M-B2
CN942 3P
DC OUT
SERIAL CONT
SS GND
TO CF-I
TO CF-I SWITCH BLOCK CN752
(See Page 181)
J902 REMOTE

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				➡
PB				⇨

FP-115 (TAPE TOP/END SENSOR/TAPE SELECT), LC-11 (LIQUID CRYSTAL DISPLAY) PRINTED WIRING BOARDS

— Ref. No. FP-115, LC-11 BOARDS: 8000 series —

- **For printed wiring boards.**
- ⊗ : Through hole
- CF-1, FK-1 and JK-63 boards are replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

FP-115 BOARD
****

DIODE

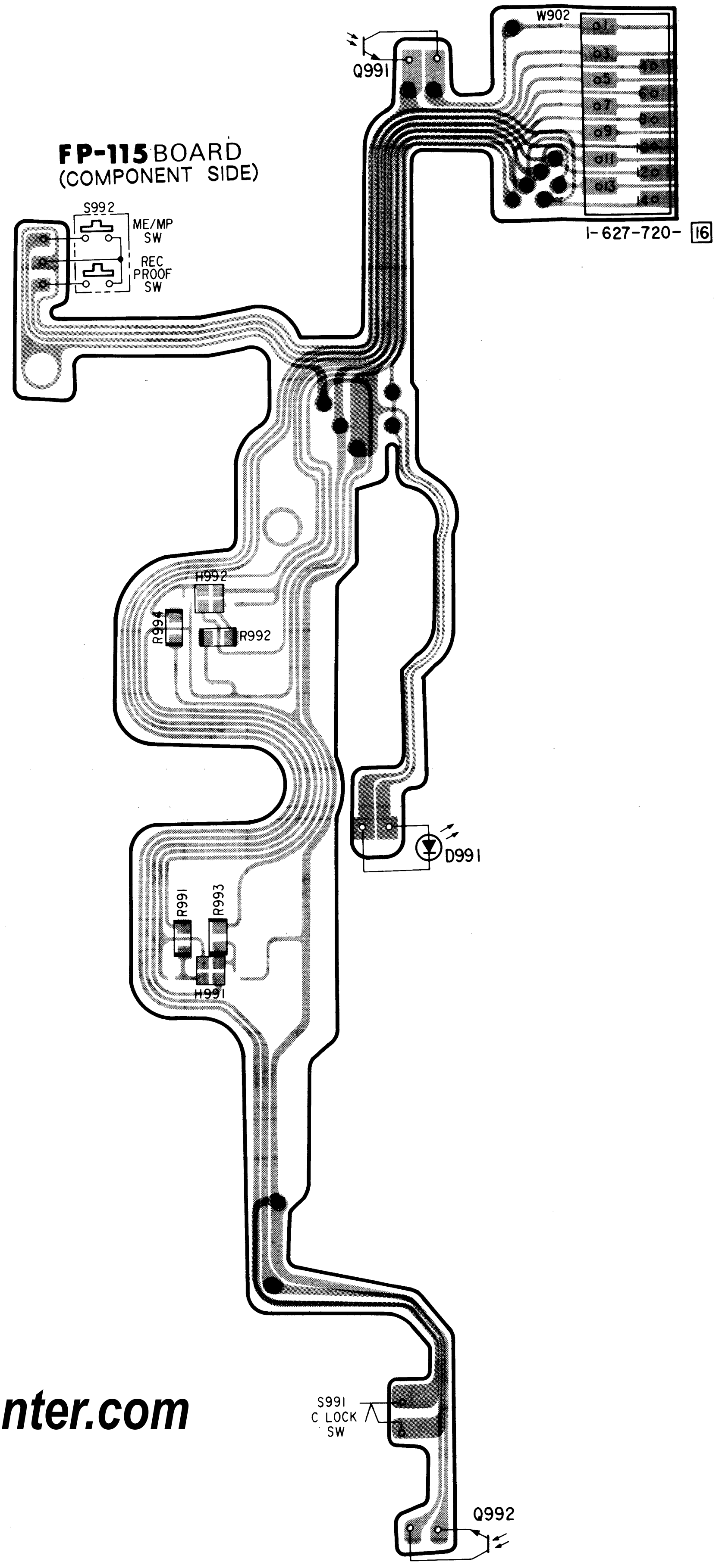
D991	8-719-951-03	DIODE GL453

ELEMENT HALL

H991	1-808-448-11	ELEMENT, HALL (CHIP TYPE)
H992	1-808-448-11	ELEMENT, HALL (CHIP TYPE)

TRANSISTOR

Q991	8-729-907-25	TRANSISTOR PT4850F (TAPE TOP)
Q992	8-729-907-25	TRANSISTOR PT4850F (TAPE END)


FP-115 BOARD
(COMPONENT SIDE)
W902
Q991
S992
ME/MP SW
REC PROOF SW
1-627-720- 16
H992
R994
R992
D991
R991
R993
H991
S991
C LOCK SW
Q992

09

FP-115 (TAPE TOP/END SENSOR/TAPE SELECT), LC-11 (LIQUID CRYSTAL DISPLAY) PRINTED WIRING BOARDS

— Ref. No. FP-115, LC-11 BOARDS: 8000 series —

- **For printed wiring boards.**
- ⊗ : Through hole
- CF-1, FK-1 and JK-63 boards are replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

FP-115 BOARD
****

DIODE

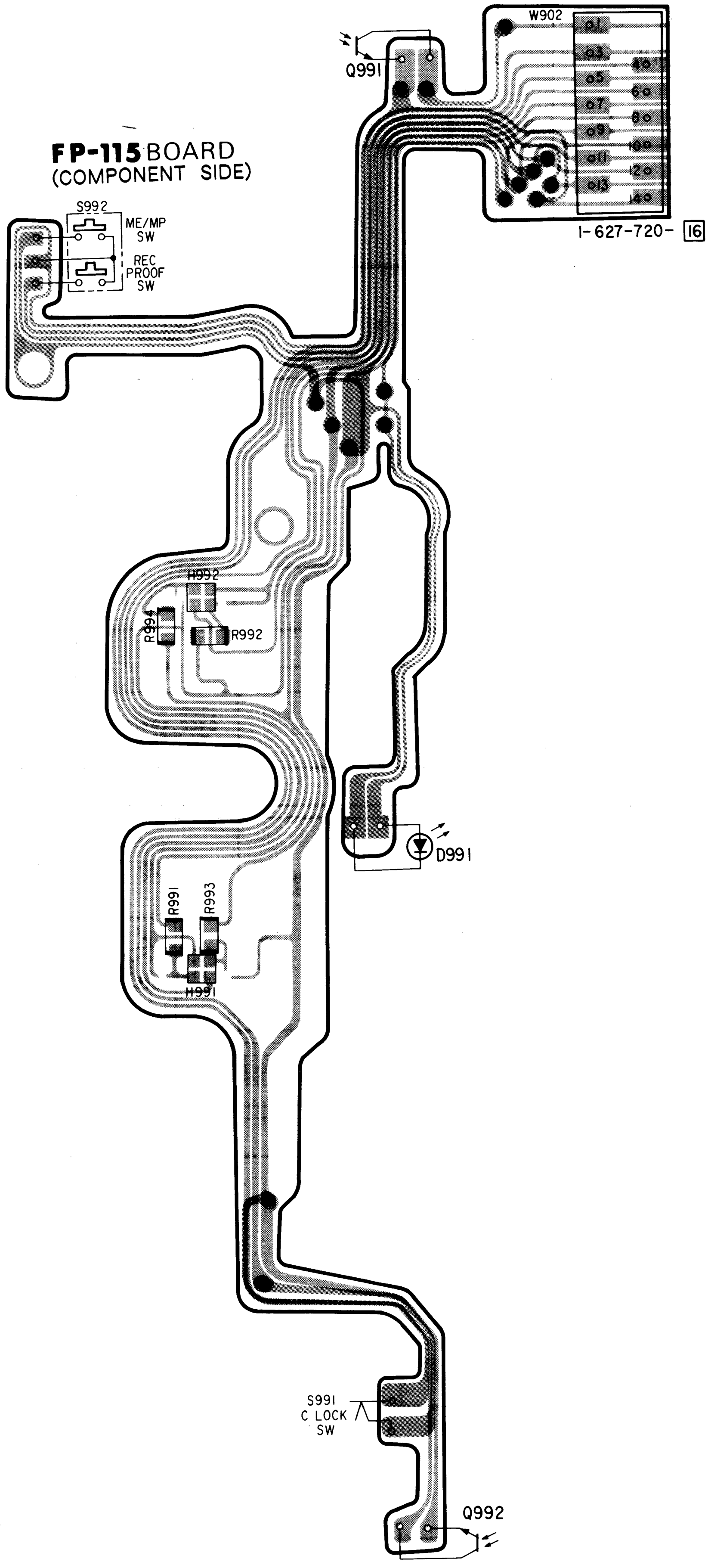
D991	8-719-951-03	DIODE GL453

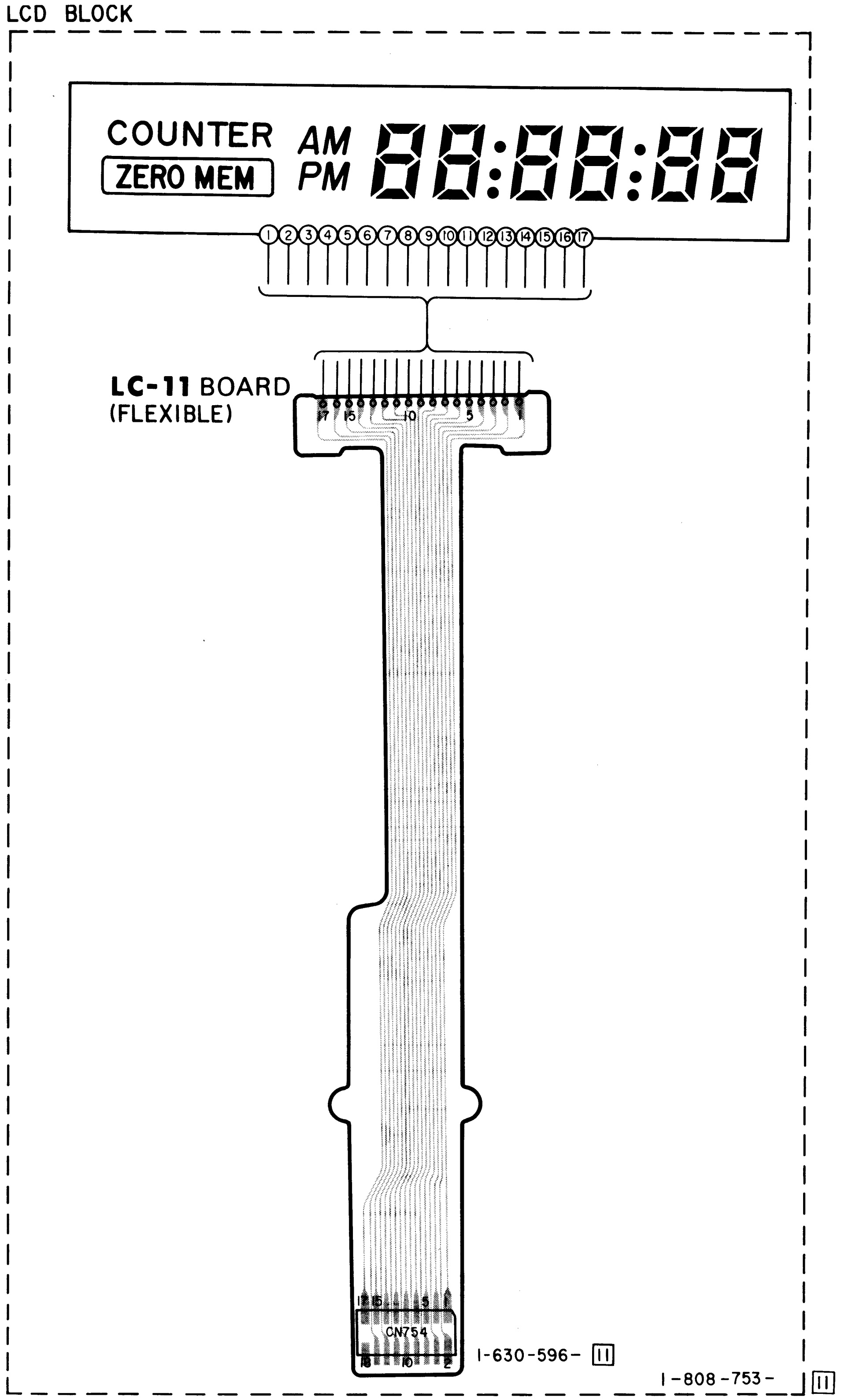
ELEMENT HALL

H991	1-808-448-11	ELEMENT, HALL (CHIP TYPE)
H992	1-808-448-11	ELEMENT, HALL (CHIP TYPE)

TRANSISTOR

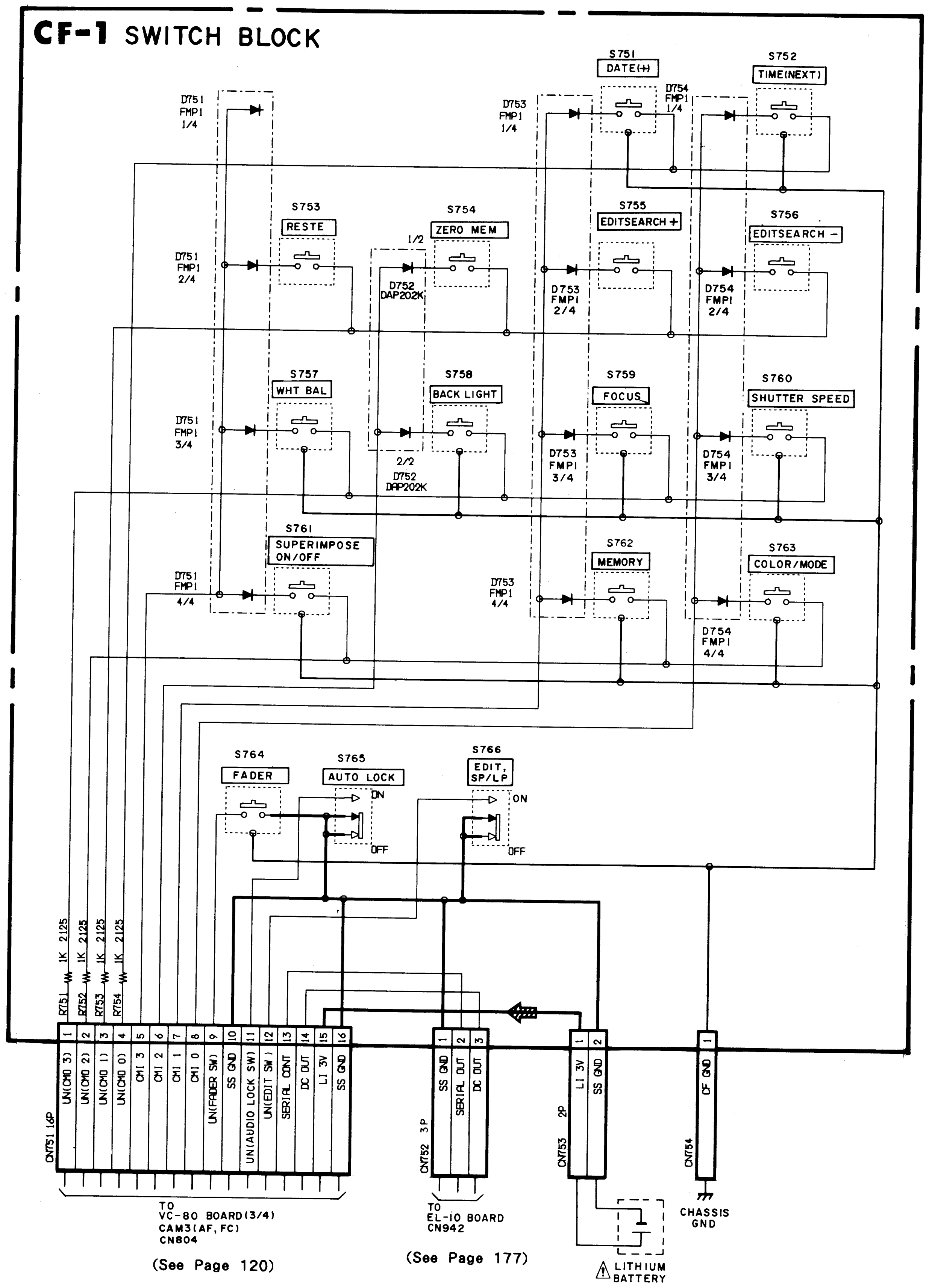
Q991	8-729-907-25	TRANSISTOR PT4850F (TAPE TOP)
Q992	8-729-907-25	TRANSISTOR PT4850F (TAPE END)

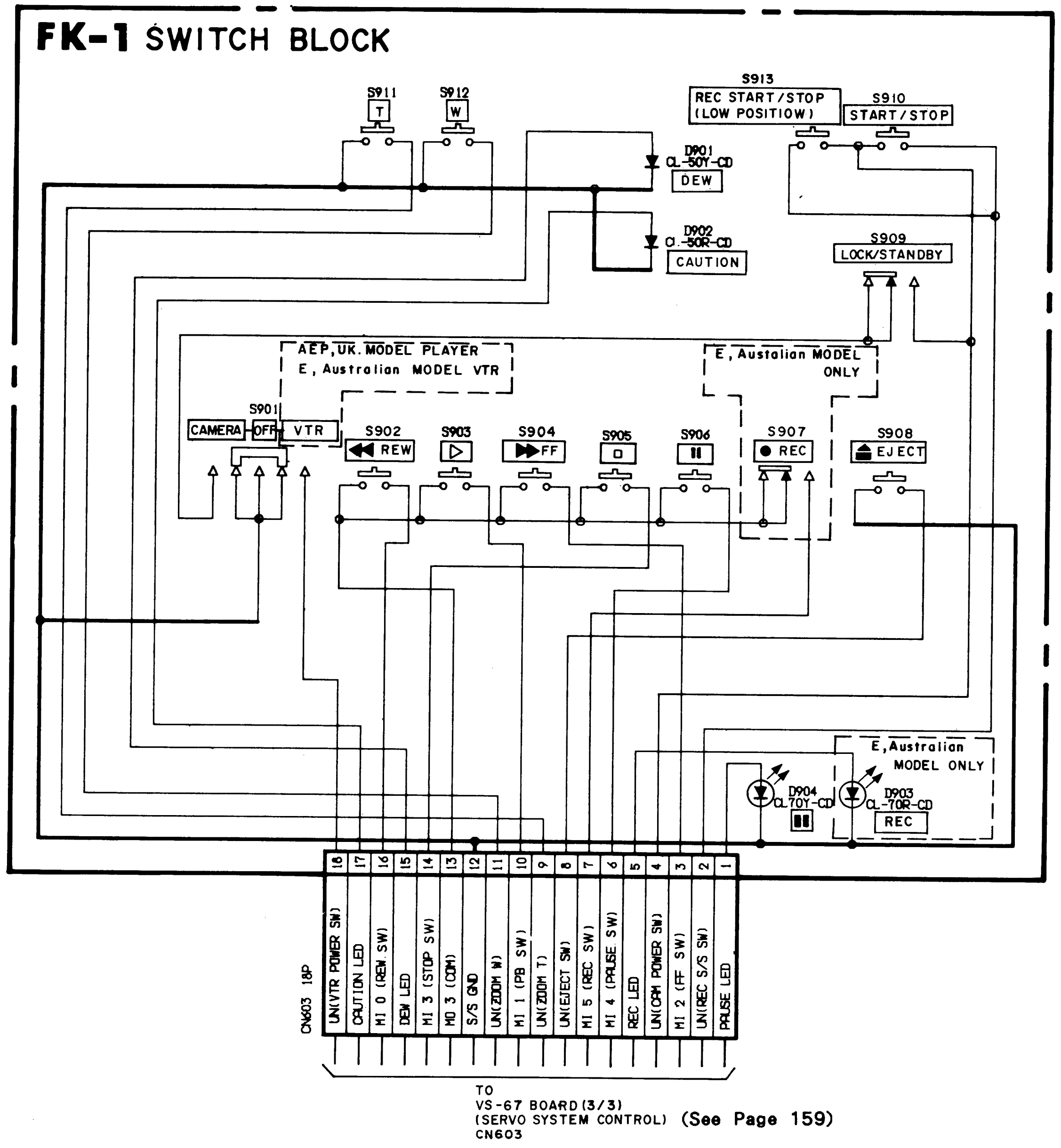

FP-115 BOARD
(COMPONENT SIDE)
W902
Q991
S992
ME/MP SW
REC PROOF SW
1-627-720- 16
H992
R994
R992
R991
R993
H991
D991
S991
C LOCK SW
Q992
09

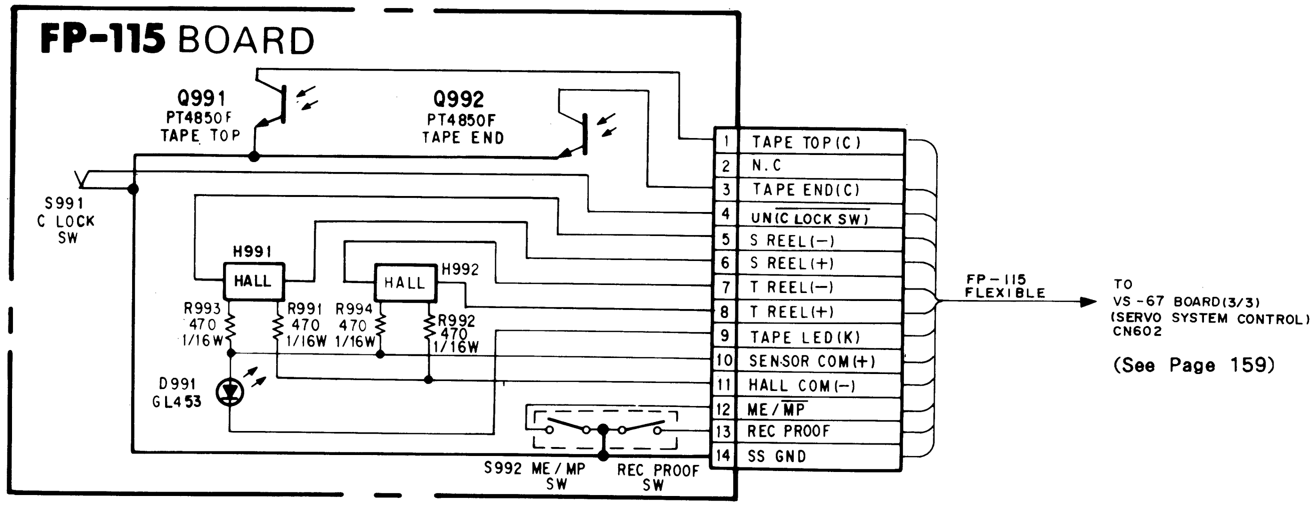

LCD BLOCK
COUNTER
ZERO MEM
AM
PM
88:88:88
①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰
LC-11 BOARD
(FLEXIBLE)
17 15 10 5 1
CN754
1-630-596- 11
1-808-753- 11

CF-1 (CAMERA FUNCTION SWITCH), FK-1 (VTR FUNCTION SWITCH), JK-63 (VIDEO/AUDIO INPUT/OUTPUT), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT), LC-11 (LIQUID CRYSTAL DISPLAY) SCHEMATIC DIAGRAMS

— Ref. No. FP-115, LC-11 BOARDS: 8000 series —


CF-1 SWITCH BLOCK
S751 DATE(+)
S752 TIME(NEXT)
D751 FMP1 1/4
D753 FMP1 1/4
D754 FMP1 1/4
S753 RESTE
S754 ZERO MEM
S755 EDITSEARCH +
S756 EDITSEARCH −
D751 FMP1 2/4
D752 DAP202K 1/2
D753 FMP1 2/4
D754 FMP1 2/4
S757 WHT BAL
S758 BACK LIGHT
S759 FOCUS
S760 SHUTTER SPEED
D751 FMP1 3/4
D752 DAP202K 2/2
D753 FMP1 3/4
D754 FMP1 3/4
S761 SUPERIMPOSE ON/OFF
S762 MEMORY
S763 COLOR/MODE
D751 FMP1 4/4
D753 FMP1 4/4
D754 FMP1 4/4
S764 FADER
S765 AUTO LOCK
ON
OFF
S766 EDIT, SP/LP
ON
OFF
R751 1K 2125
R752 1K 2125
R753 1K 2125
R754 1K 2125
CN751 16P
1 UN(CMD 3)
2 UN(CMD 2)
3 UN(CMD 1)
4 UN(CMD 0)
5 CH1 3
6 CH1 2
7 CH1 1
8 CH1 0
9 UN(FADER SW)
10 SS GND
11 UN(AUDIO LOCK SW)
12 UN(EDIT SW)
13 SERIAL CONT
14 DC OUT
15 L1 3V
16 SS GND
CN752 3P
1 SS GND
2 SERIAL OUT
3 DC OUT
CN753 2P
1 L1 3V
2 SS GND
CN754
1 CF GND
CHASSIS GND
LITHIUM BATTERY
TO VC-80 BOARD (3/4) CAM3 (AF, FC) CN804
(See Page 120)
TO EL-10 BOARD CN942
(See Page 177)


FK-1 SWITCH BLOCK
S911 T
S912 W
S913 REC START/STOP (LOW POSITION)
S910 START/STOP
D901 CL-50Y-CD DEW
D902 CL-50R-CD CAUTION
S909 LOCK/STANDBY
AEP, UK. MODEL PLAYER
E, Australian MODEL VTR
E, Australian MODEL ONLY
S901 CAMERA OFF VTR
S902 REW
S903
S904 FF
S905
S906
S907 REC
S908 EJECT
E, Australian MODEL ONLY
D904 CL-70Y-CD
D903 CL-70R-CD REC
CN603 18P
18 UN(VTR POWER SW)
17 CAUTION LED
16 HI 0 (REW SW)
15 DEW LED
14 HI 3 (STOP SW)
13 MO 3 (CDM)
12 S/S GND
11 UN(ZOOM W)
10 HI 1 (PB SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 HI 5 (REC SW)
6 HI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 HI 2 (FF SW)
2 UN(REC S/S SW)
1 PAUSE LED
TO VS-67 BOARD (3/3) (SERVO SYSTEM CONTROL) CN603 (See Page 159)

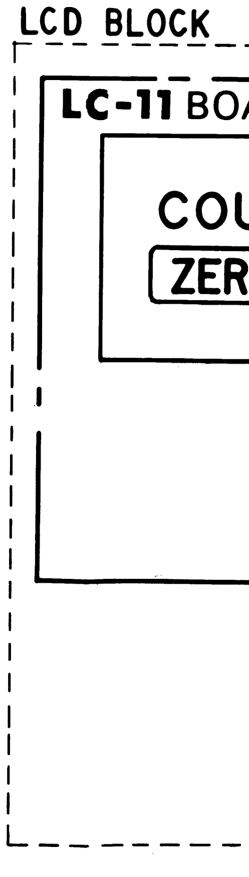

FP-115 BOARD
Q991 PT4850F TAPE TOP
Q992 PT4850F TAPE END
S991 C LOCK SW
H991 HALL
H992 HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991 GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 UN(C LOCK SW)
5 S REEL(−)
6 S REEL(+)
7 T REEL(−)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(−)
12 ME/MP
13 REC PROOF
14 SS GND
FP-115 FLEXIBLE
TO VS-67 BOARD (3/3) (SERVO SYSTEM CONTROL) CN602
(See Page 159)

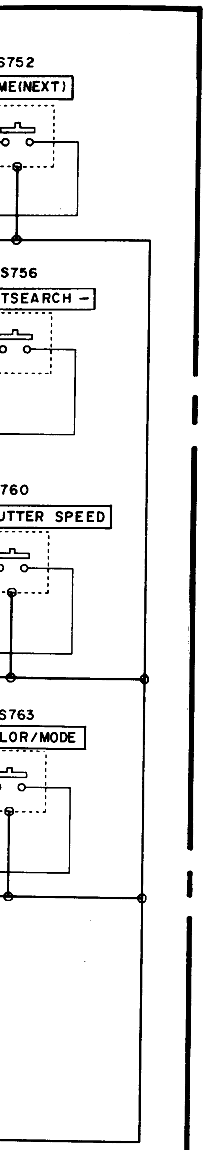
• SIGNAL PATH

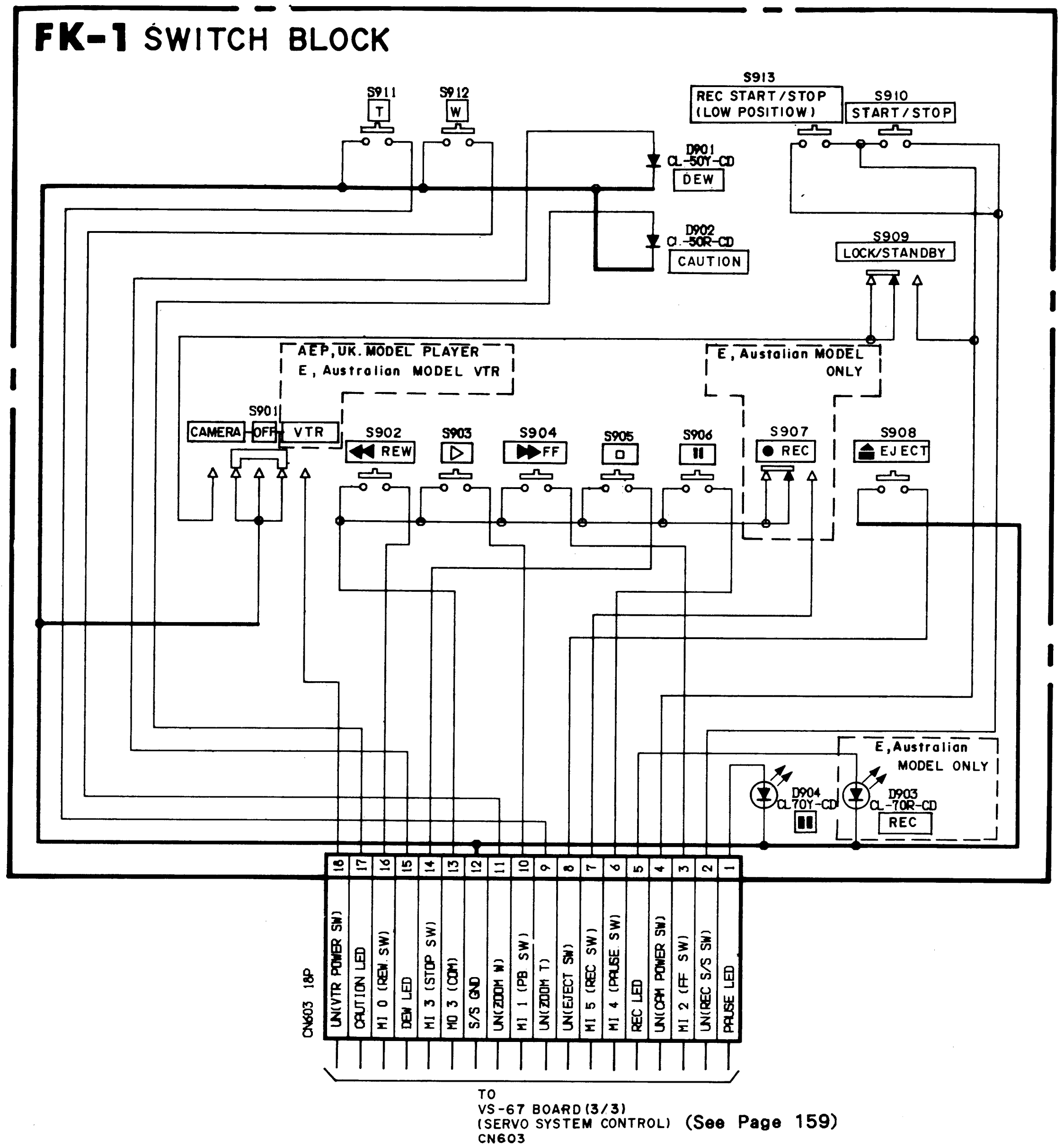
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA/DA
REC			⇛
PB			⇛

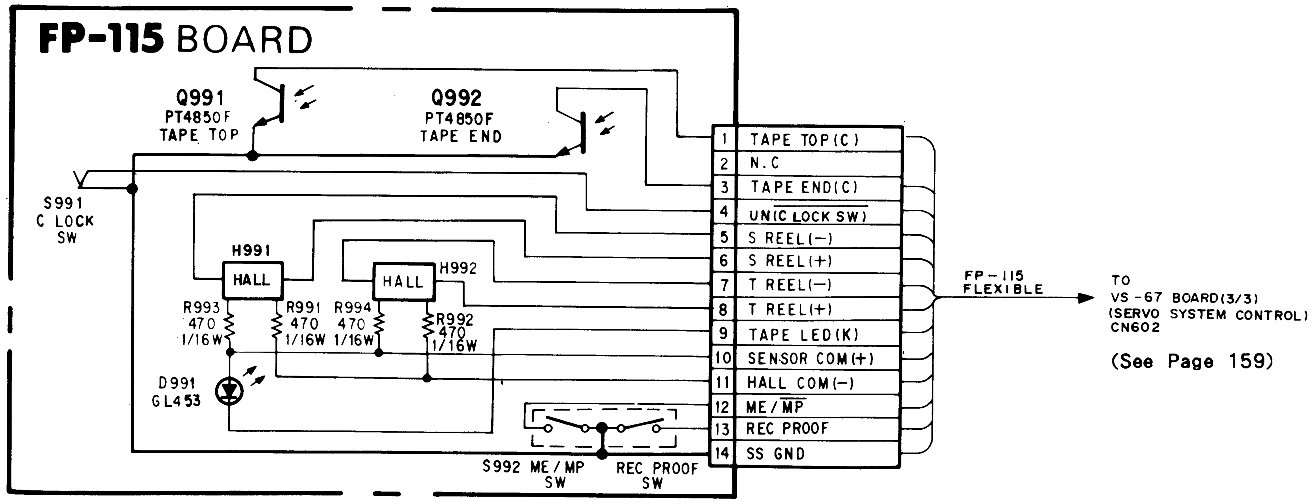
TO VS-67 BOARD (2/3) (VIDEO) CN201

(See Page 155)


LCD BLOCK
LC-11 BO
COU
ZER

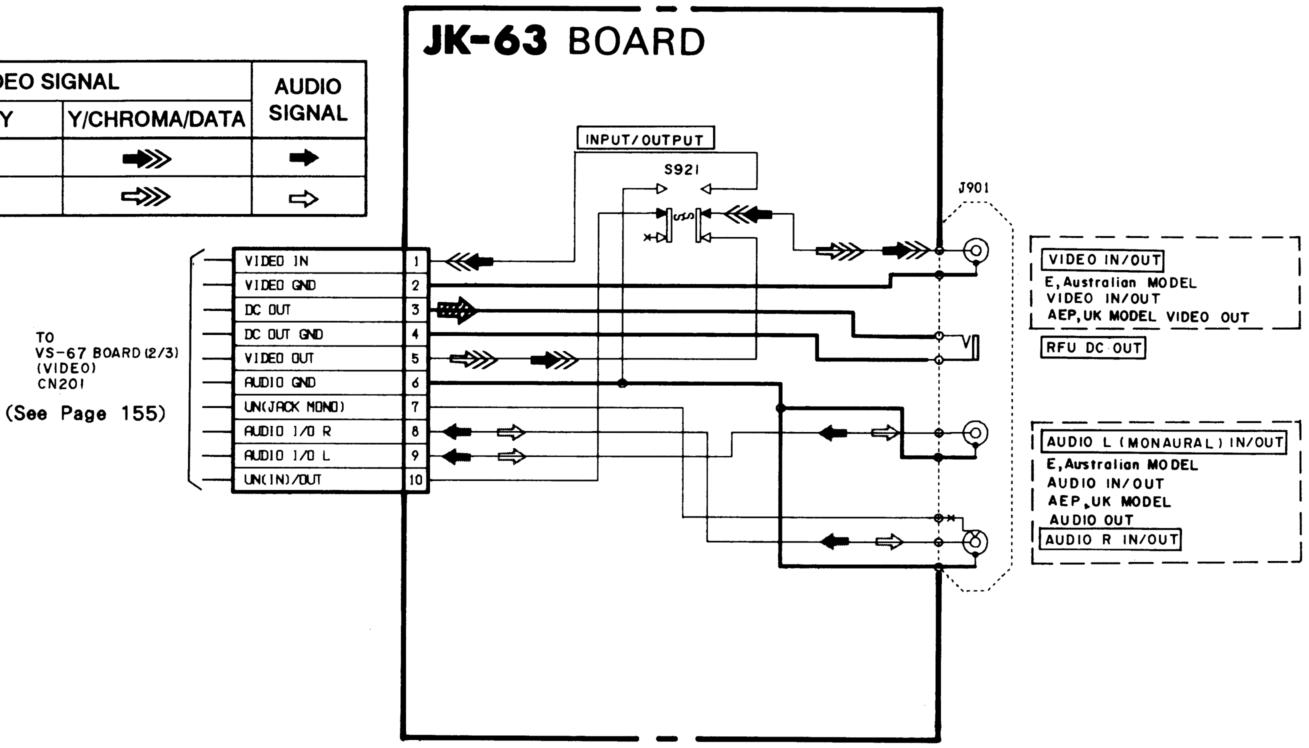

S752
ME(NEXT)
S756
TSEARCH -
760
UTTER SPEED
S763
LOR/MODE


FK-1 SWITCH BLOCK
S911
T
S912
W
S913
REC START/STOP (LOW POSITION)
S910
START/STOP
D901 CL-50Y-CD
DEW
D902 CL-50R-CD
CAUTION
S909
LOCK/STANDBY
AEP,UK MODEL PLAYER
E, Australian MODEL VTR
E, Australian MODEL ONLY
S901
CAMERA
OFF
VTR
S902
REW
S903
S904
FF
S905
S906
S907
REC
S908
EJECT
E, Australian MODEL ONLY
D904 CL-70Y-CD
D903 CL-70R-CD
REC
CN603 18P
18 UN(VTR POWER SW)
17 CAUTION LED
16 MI 0 (REW SW)
15 DEW LED
14 MI 3 (STOP SW)
13 MO 3 (COM)
12 S/S GND
11 UN(ZOOM W)
10 MI 1 (PB SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 MI 5 (REC SW)
6 MI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 MI 2 (FF SW)
2 UN(REC S/S SW)
1 PAUSE LED
TO
VS-67 BOARD (3/3)
(SERVO SYSTEM CONTROL) (See Page 159)
CN603


FP-115 BOARD
Q991
PT4850F
TAPE TOP
Q992
PT4850F
TAPE END
S991
C LOCK
SW
H991
HALL
H992
HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991
GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 UN(C LOCK SW)
5 S REEL(−)
6 S REEL(+)
7 T REEL(−)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(−)
12 ME/MP
13 REC PROOF
14 SS GND
FP-115 FLEXIBLE
TO
VS-67 BOARD(3/3)
(SERVO SYSTEM CONTROL)
CN602
(See Page 159)

- SIGNAL PATH

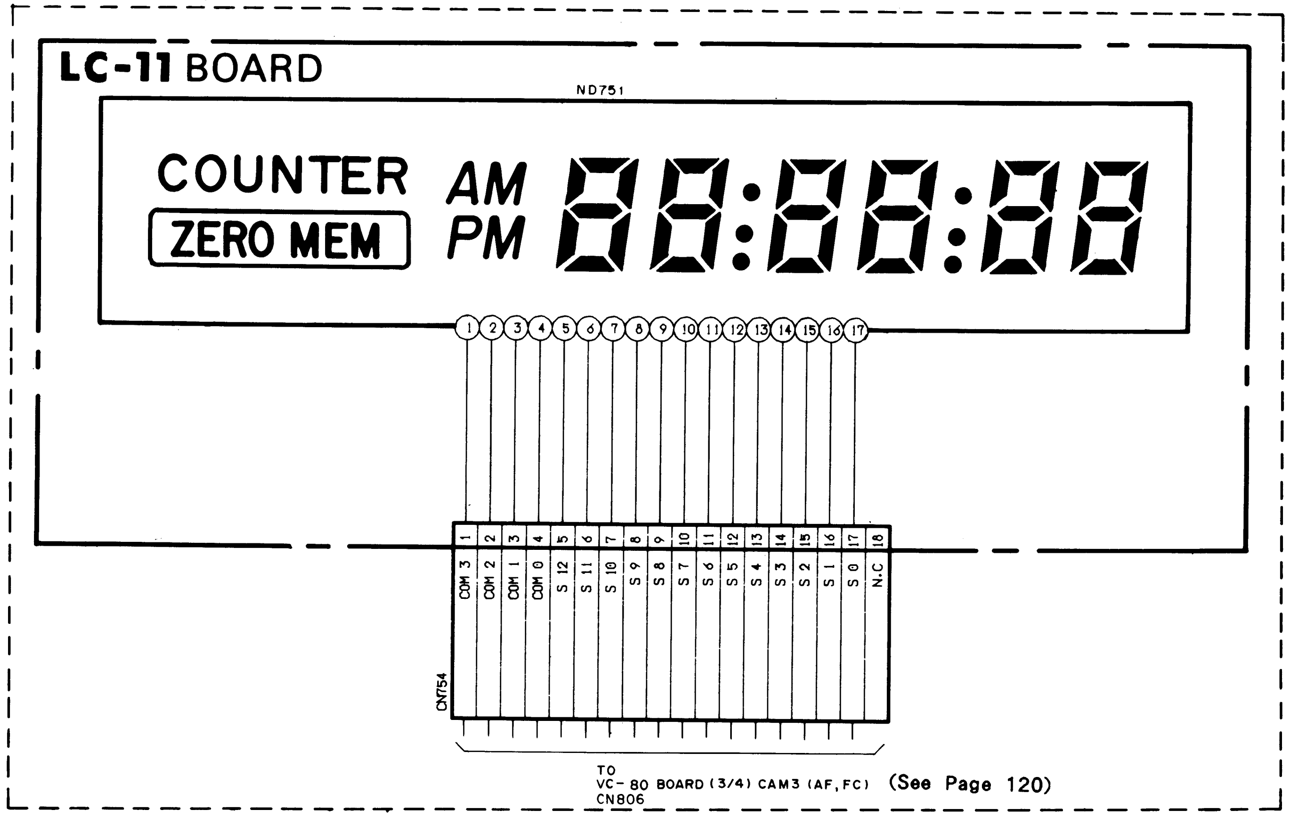
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡》	➡
PB			⇨》	⇨


JK-63 BOARD
INPUT/OUTPUT
S921
J901
1 VIDEO IN
2 VIDEO GND
3 DC OUT
4 DC OUT GND
5 VIDEO OUT
6 AUDIO GND
7 UN(JACK MONO)
8 AUDIO I/O R
9 AUDIO I/O L
10 UN(IN)/OUT
TO
VS-67 BOARD (2/3)
(VIDEO)
CN201
(See Page 155)
VIDEO IN/OUT
E, Australian MODEL
VIDEO IN/OUT
AEP, UK MODEL VIDEO OUT
RFU DC OUT
AUDIO L (MONAURAL) IN/OUT
E, Australian MODEL
AUDIO IN/OUT
AEP, UK MODEL
AUDIO OUT
AUDIO R IN/OUT

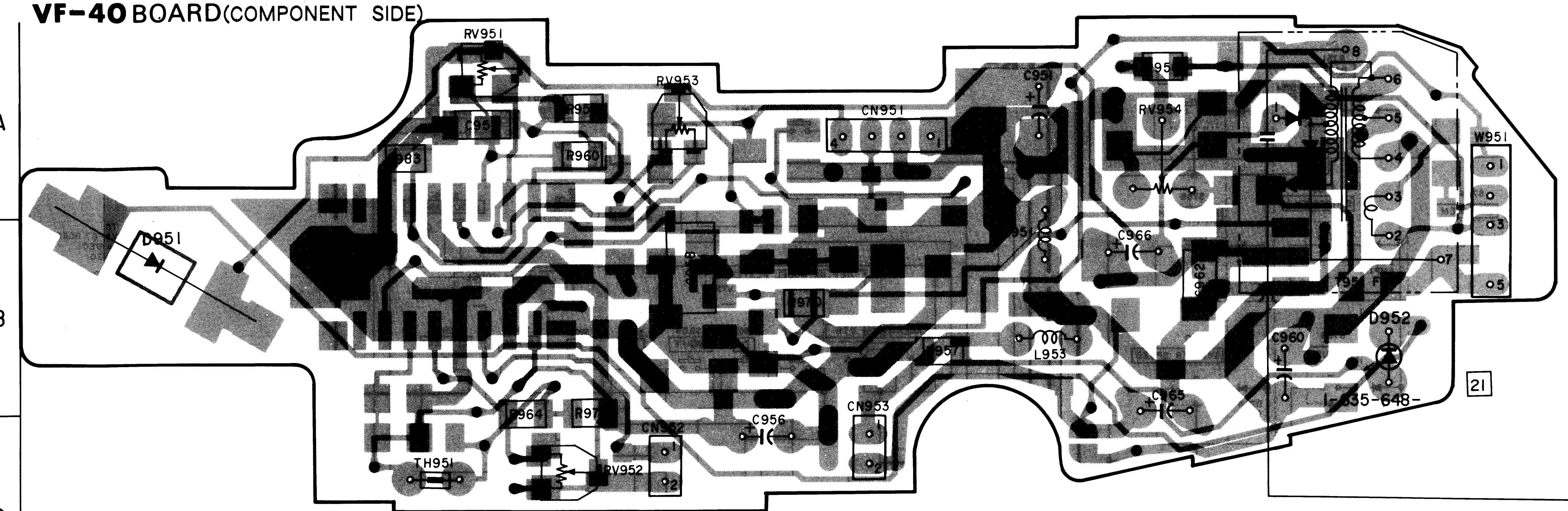
[Video/audio input/output switch (S921 on the JK-63 board) - for AEP/UK model]

Switch S921 is mounted on the JK-63 board, regardless of the destinations.
For AEP/UK model, however, the output cover is provided that won't be attached at the input position.
For AEP/UK model, S921 will function as IN/OUT switch of the video/audio like AUS and E models by switching with the cabinet(L)assembly removed.

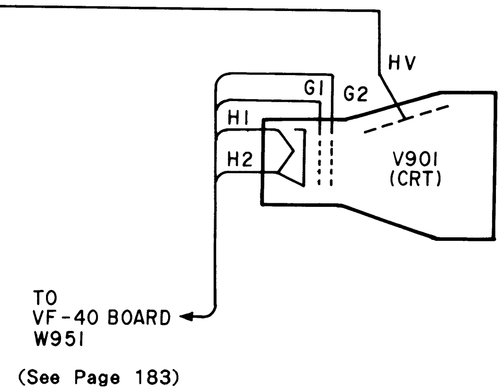
LCD BLOCK


LC-11 BOARD
ND751
COUNTER
ZERO MEM
AM
PM
88:88:88
CN754
1 COM 3
2 COM 2
3 COM 1
4 COM 0
5 S 12
6 S 11
7 S 10
8 S 9
9 S 8
10 S 7
11 S 6
12 S 5
13 S 4
14 S 3
15 S 2
16 S 1
17 S 0
18 N.C
TO
VC-80 BOARD (3/4) CAM3 (AF,FC) (See Page 120)
CN806

VF-40 BOARD (COMPONENT SIDE)

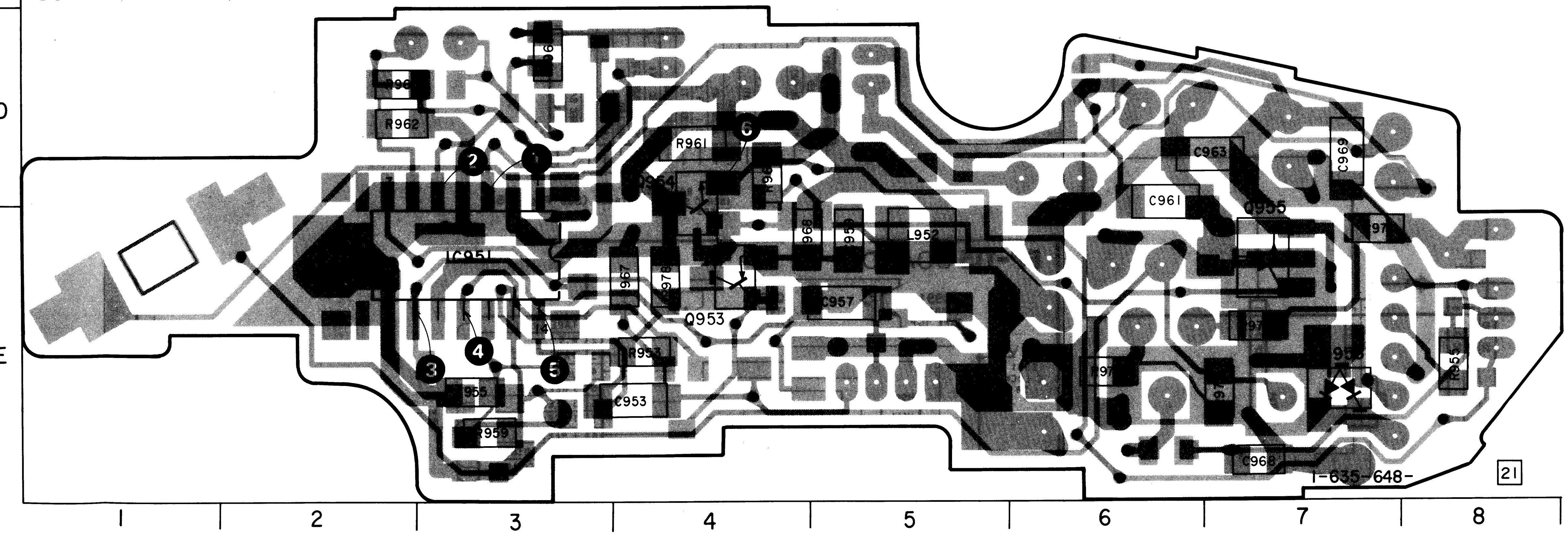


RV951
RV953
CN951
C951
RV954
W951
D951
C966
D952
C960
L953
CN953
C965
C956
CN952
RV952
TH951
R960
R964
R970
1-635-648-
21
A
B
C



HV
G1
G2
H1
H2
V901
(CRT)
TO
VF-40 BOARD
W951
(See Page 183)

VF-40 BOARD (CONDUCTOR SIDE)



R962
R961
IC951
Q954
Q953
C957
L952
C961
C963
C969
Q955
C953
R959
R955
C968
1-635-648-
21
1
2
3
4
5
6
D
E
1
2
3
4
5
6
7
8

09

VF-40 (ELECTRICAL VIEW FINDER) PRINTED WIRING BOARDS

— Ref. No. VF-40 BOARD: 9000 series —

- **For printed wiring boards.**
- ● : Through hole.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

VF-40 BOARD
****

DIODE

D951	8-719-820-65	DIODE TLS221
D952	8-719-800-60	DIODE TLR214
D953	8-719-400-20	DIODE MA152WA

IC

IC951	8-759-420-01	IC AN2512S

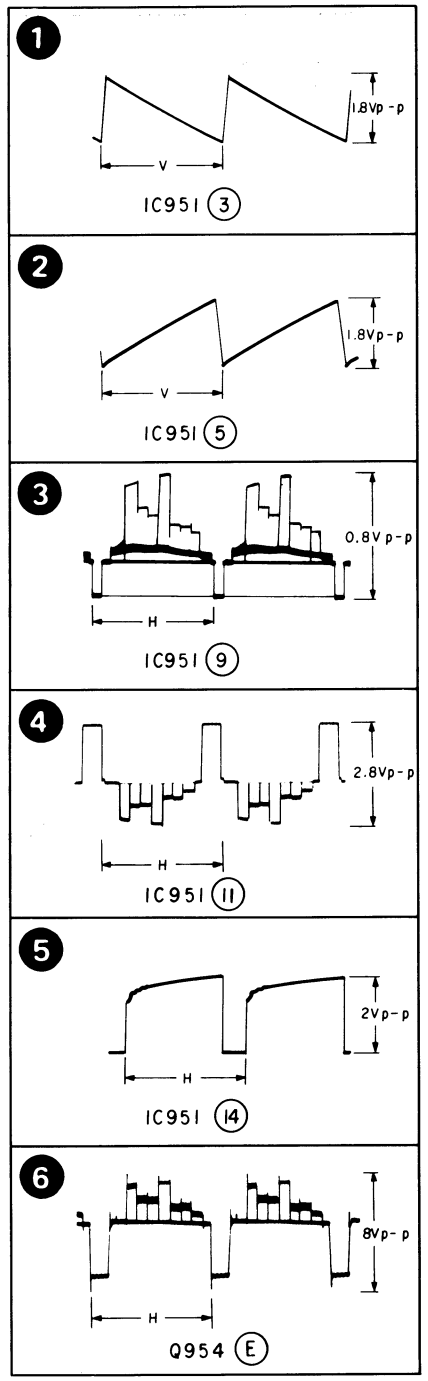
TRANSISTOR

Q953	8-729-216-22	TRANSISTOR 2SA1162
Q954	8-729-100-67	TRANSISTOR 2SC1623-L7
Q955	8-729-106-68	TRANSISTOR 2SD1615A-GP

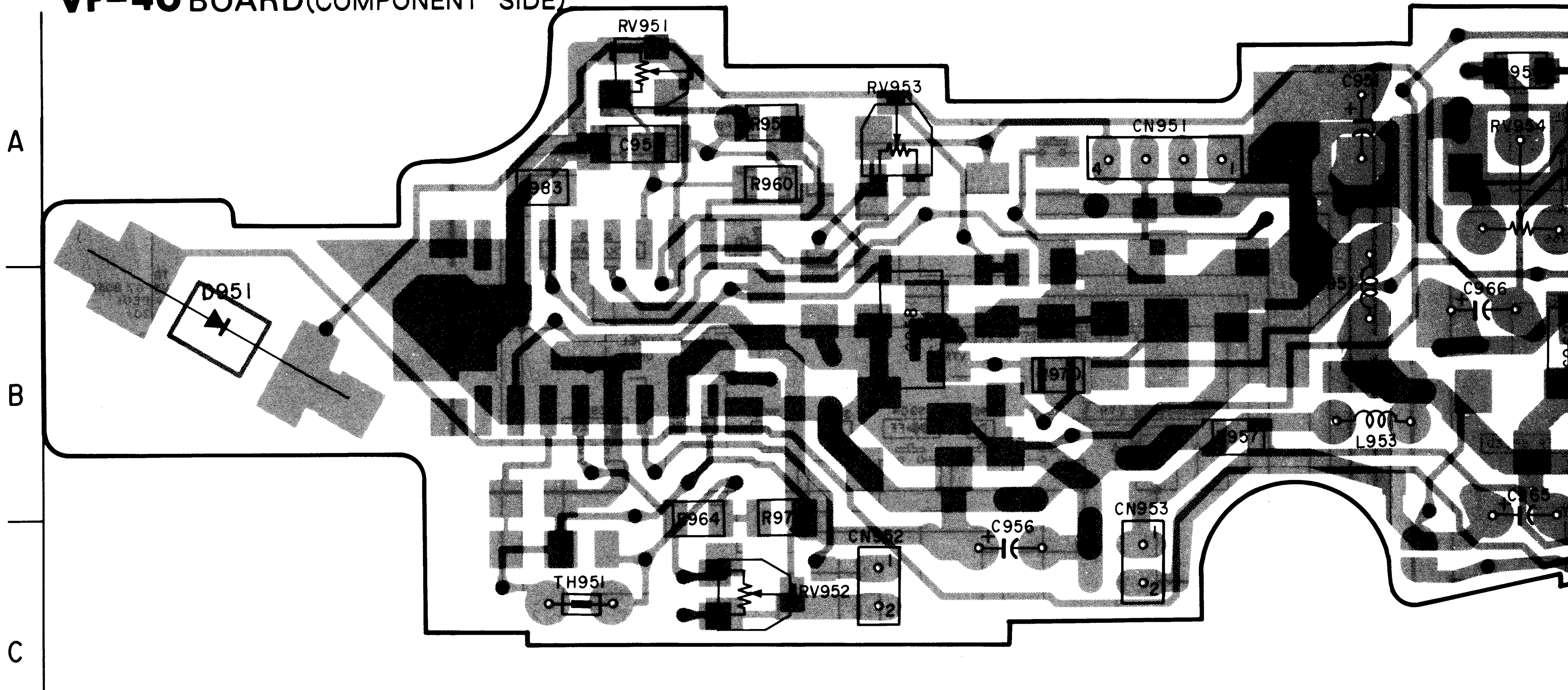
THERMISTOR

TH951	1-807-938-11	THERMISTOR

VF-40 BOARD

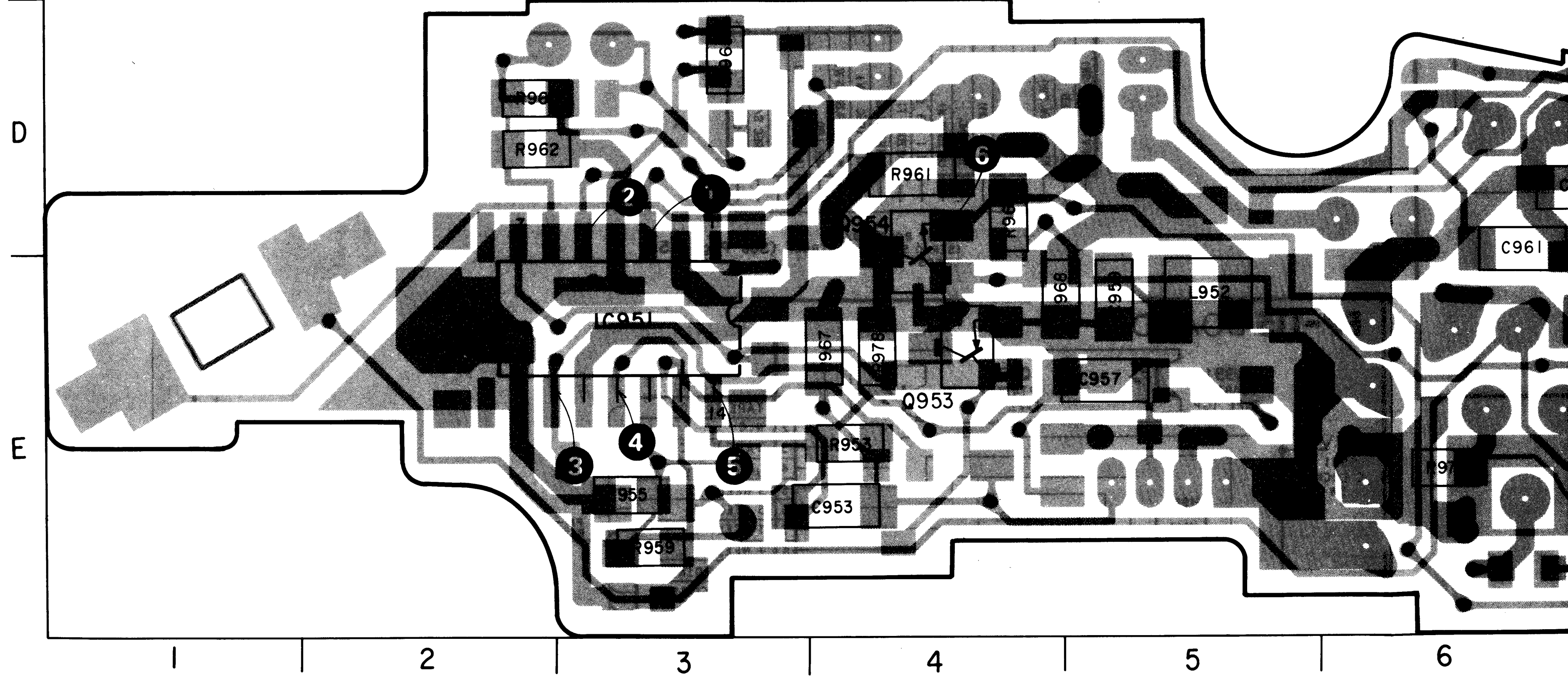


VF-40 BOARD(COMPONENT SIDE)



A
B
C
RV951
RV953
CN951
D951
C966
L953
C956
CN953
CN952
TH951
RV952
R960
C964

VF-40 BOARD(CONDUCTOR SIDE)



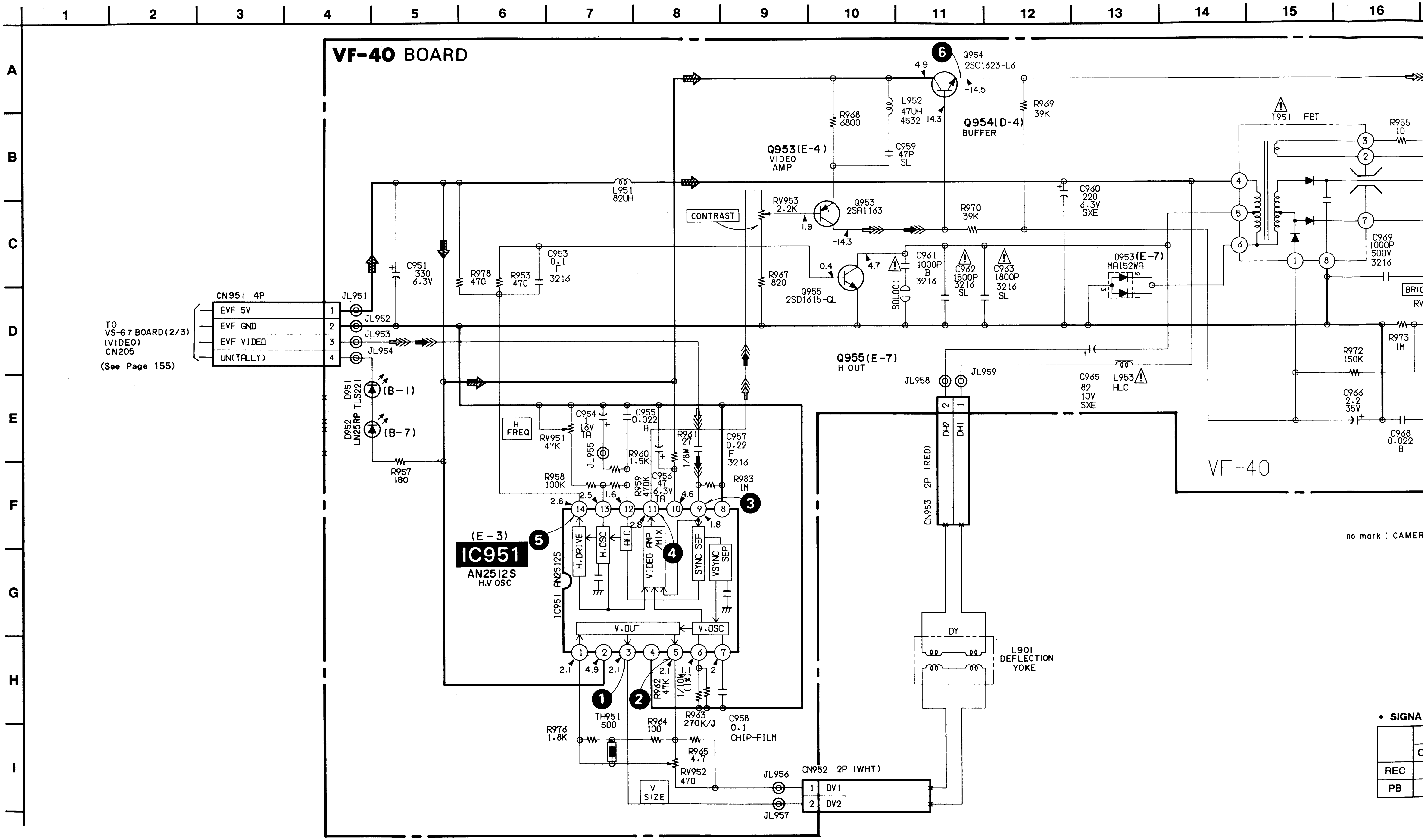
D
E
R962
R961
IC951
Q954
Q953
L952
C961
C957
C953
R959
❶
❷
❸
❹
❺
❻
1
2
3
4
5
6

VF-40 (ELECTRICAL VIEW FINDER) SCHEMATIC DIAGRAMS

— Ref. No. VF-40 BOARD: 9000 series —

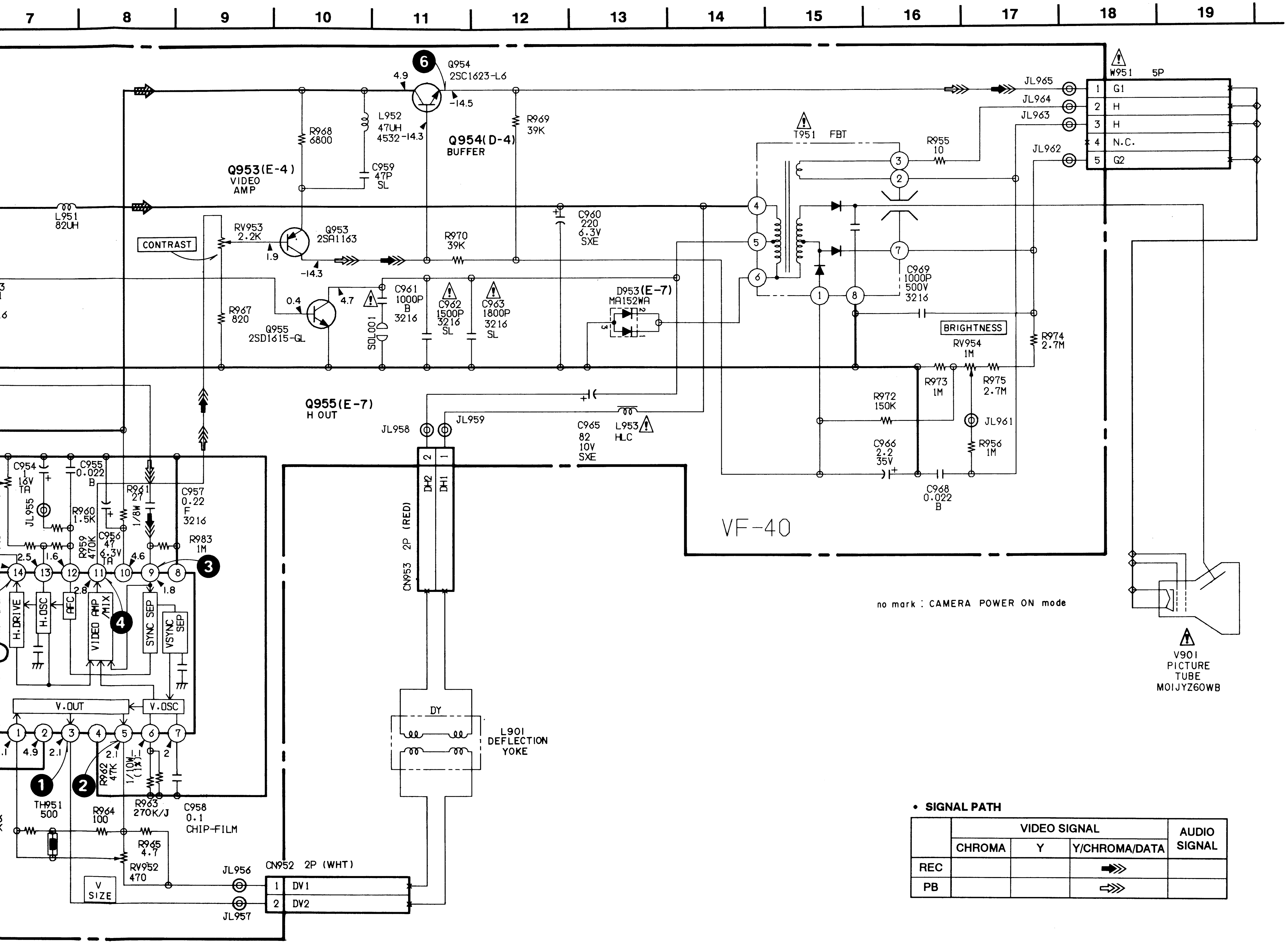
- **For schematic diagrams.**
- Chip resistor are 1/10W unless otherwise noted.

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I
VF-40 BOARD
CN951 4P
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
TO VS-67 BOARD(2/3) (VIDEO) CN205
(See Page 155)
JL951
JL952
JL953
JL954
D951 LN25RP TLS221 (B-1)
D952 LN25RP TLS221 (B-7)
R957 180
C951 330 6.3V
R978 470
R953 470
C953 0.1 F 3216
L951 82UH
CONTRAST
RV953 2.2K
Q953 2SA1163
Q953(E-4) VIDEO AMP
R968 6800
L952 47UH 4532
C959 47P SL
Q954 2SC1623-L6
Q954(D-4) BUFFER
R969 39K
R970 39K
R967 820
Q955 2SD1615-GL
Q955(E-7) H OUT
SDL001
C961 1000P B 3216
C962 1500P 3216 SL
C963 1800P 3216 SL
C960 220 6.3V SXE
D953(E-7) MA152WA
T951 FBT
R955 10
C969 1000P 500V 3216
R972 150K
R973 1M
C965 82 10V SXE
L953 HLC
C966 2.2 35V
C968 0.022 B
BRIG
JL958
JL959
CN953 2P (RED)
DH2
DH1
VF-40
no mark : CAMER
H FREQ
RV951 47K
C954 1 16V TA
C955 0.022 B
JL955
R958 100K
R960 1.5K
R959 470K
C956 47 6.3V TA
R961 27 1/8W
C957 0.22 F 3216
R983 1M
(E-3)
IC951
AN2512S
H.V OSC
IC951 AN2512S
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
R962 47K
1/10W (1%)
R963 270K/J
C958 0.1 CHIP-FILM
TH951 500
R964 100
R976 1.8K
R965 4.7
RV952 470
V SIZE
JL956
JL957
CN952 2P (WHT)
DV1
DV2
DY
L901 DEFLECTION YOKE
• SIGNA
REC
PB
4.9
-14.5
-14.3
1.9
0.4
4.7
2.6
2.5
1.6
2.8
4.6
1.8
2.1
2
❶
❷
❸
❹
❺
❻

e noted.

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


7
8
9
10
11
12
13
14
15
16
17
18
19
6
Q954
2SC1623-L6
4.9
-14.5
L952
47UH
4532
-14.3
R968
6800
C959
47P
SL
R969
39K
Q954(D-4)
BUFFER
Q953(E-4)
VIDEO
AMP
L951
82UH
CONTRAST
RV953
2.2K
1.9
Q953
2SA1163
-14.3
R970
39K
C960
220
6.3V
SXE
R967
820
0.4
4.7
Q955
2SD1615-GL
SDL001
C961
1000P
B
3216
C962
1500P
3216
SL
C963
1800P
3216
SL
D953(E-7)
MA152WA
T951 FBT
R955
10
C969
1000P
500V
3216
BRIGHTNESS
RV954
1M
R974
2.7M
R973
1M
R975
2.7M
R972
150K
JL961
R956
1M
C966
2.2
35V
C968
0.022
B
C965
82
10V
SXE
L953
HLC
Q955(E-7)
H OUT
JL958
JL959
JL965
JL964
JL963
JL962
W951 5P
1 G1
2 H
3 H
4 N.C.
5 G2
VF-40
V901
PICTURE
TUBE
M01JYZ60WB
CN953 2P (RED)
DH2
DH1
DY
L901
DEFLECTION
YOKE
C954
1
16V
TA
C955
0.022
B
JL955
R960
1.5K
R961
27
1/8W
C957
0.22
F
3216
R983
1M
C956
47
6.3V
TA
R959
470K
2.5
1.6
2.8
4.6
1.8
3
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
4
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
4.9
2.1
2.1
1.1
2
1
2
R962
47K
1/10W
TH951
500
R964
100
R963
270K/J
C958
0.1
CHIP-FILM
R965
4.7
RV952
470
V SIZE
JL956
JL957
CN952 2P (WHT)
1 DV1
2 DV2

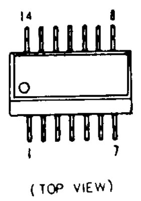
no mark : CAMERA POWER ON mode

- **SIGNAL PATH**

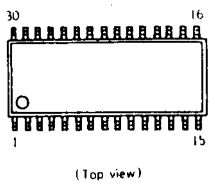
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC			➡	
PB			⇨	

4-3. SEMICONDUCTORS

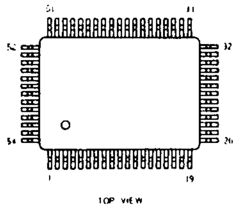
AN2512S


14
8
1
7
(TOP VIEW)

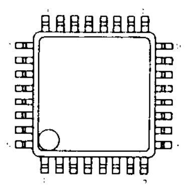
CXA1047M
CXA1127AM


30
16
1
15
(Top view)

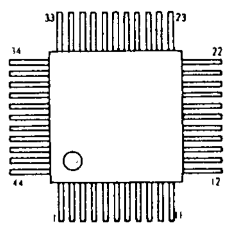
CXA1200BQ
µPD7503GF-J51-3B8



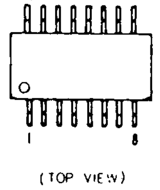
CXA1201Q



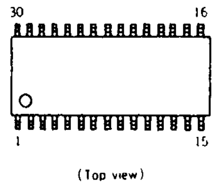
CXA1204Q


33
23
34
22
44
12

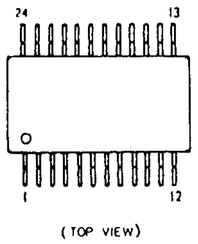
CXD1172AM
CXD1172M


16
9
1
8
(TOP VIEW)

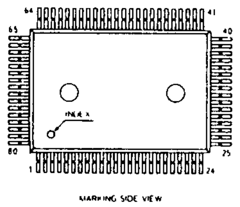
CXL1502M


30
16
1
15
(Top view)

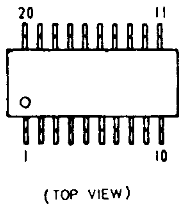
CXL1505N


24
13
1
12
(TOP VIEW)

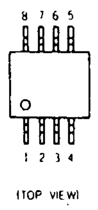
CXP80116-690Q


MARKING SIDE VIEW

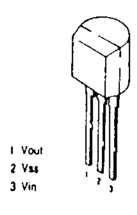
MB88341PFV
MB88346PFV
MPC1737M
µPD6145G


20
11
1
10
(TOP VIEW)

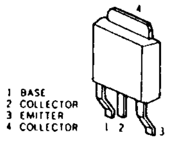
RC3414M
µPC1037GR


8 7 6 5
1 2 3 4
(TOP VIEW)

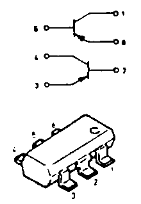
S-81350AG-REG


1 Vout
2 Vss
3 Vin

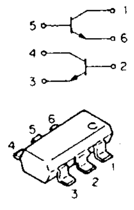
2SB1202FAS


1 BASE
2 COLLECTOR
3 EMITTER
4 COLLECTOR
1 2 3
4

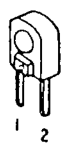
IMT1US
FC101
XN4111
XN4113



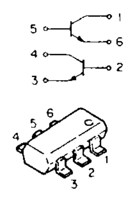
FC102
XN4210
XN4215
XN4401



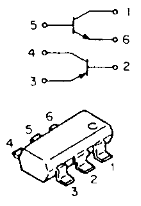
PT4850F



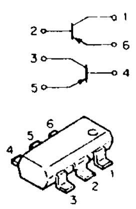
XN4213
XN4501



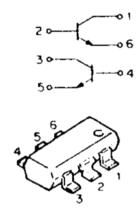
XN4601
XN4312
IMZ1



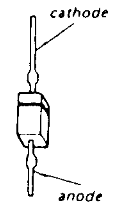
XN6401



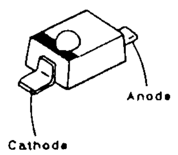
XN6215
XN6501



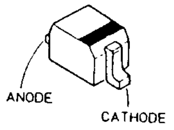
1SS283


cathode
anode

1T32
1T33C


Anode
Cathode

MA110
MA111
MA729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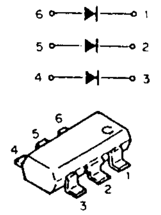
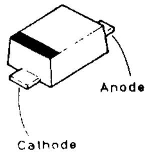
MA121



MA8082-M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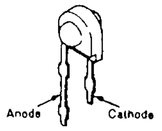
GL453


Anode
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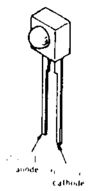
TLR214


Anode
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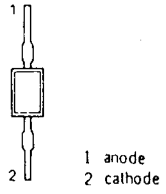
TLS221


1
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1 anode
2 cathode

SECTION 5

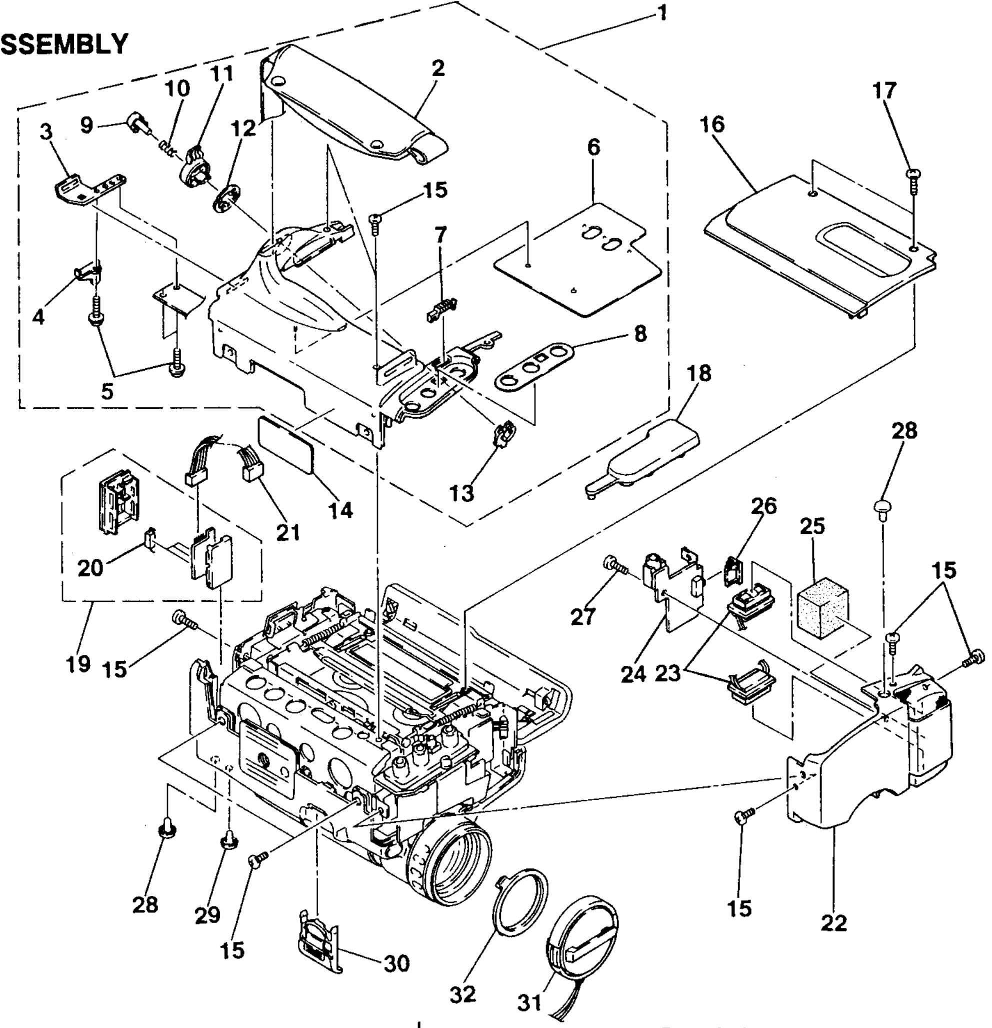
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (L) ASSEMBLY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Ref.No.	Part No.	Description	Remark
1	A-7081-259-A	CABINET (L) BLOCK ASSY (E, Australian MODEL)	2-13, 31
1	A-7081-375-A	CABINET (L) BLOCK ASSY (AEP, UK MODEL)	2-13, 31
2	3-736-807-01	BELT, GRIP	
3	3-736-338-01	BRACKET, BELT	
4	3-736-360-01	JOINT, LR	
5	3-669-480-11	+ PTPWH 2	
6	3-747-128-01	COVER (S), DRUM	
7	3-747-118-01	KNOB, IN-OUT (E, Australian MODEL)	
7	3-749-704-01	LID, IN OUT (AEP, UK MODEL)	
8	3-747-134-21	COVER, I/O	
9	3-736-343-01	BUTTON, S/S	
10	3-578-221-00	SPRING, COMPRESSION	
11	3-736-391-01	KNOB, STAND-BY	
12	3-736-364-01	SPRING	
13	3-736-344-01	HOLDER, STAND-BY KNOB	
14	*3-749-868-01	LABEL, MODEL NUMBER (AEP) (AEP MODEL)	
14	*3-940-446-01	LABEL, MODEL NUMBER (UK) (UK, E, Australian MODEL)	
15	3-719-381-01	SCREW (M2X4)	
16	X-3749-171-1	LID ASSY, CASSETTE	
17	3-727-902-11	SCREW (M1.4), SPECIAL	
18	3-747-145-01	COVER, JACK	
19	1-537-296-31	TERMINAL BOARD (BATTERY)	20
20 ⚠	1-532-841-41	LINK, IC (1.6A)	
21	1-944-055-11	HARNESS (CD-26)	
22	X-3747-116-1	PANEL ASSY, F	
23	1-542-126-21	MICROPHONE UNIT	
24	*A-7062-409-A	MA-65 BOARD, COMPLETE	
25	3-747-132-01	CUSHION (H)	
26	3-747-122-01	KNOB, WINDOW	
27	3-719-601-01	SCREW (B2X5), TAPPING	
28	3-728-267-01	COVER, 3.5 JACK (EARPHONE/MIC)	
29	3-728-266-01	COVER, 2.5 JACK (REMOTE)	
30	3-747-174-01	LID, BATTERY CASE, LITHIUM	
31	A-7091-015-B	CAP ASSY, LENS	
32	3-747-143-01	RING (CAN), NAME (TYPE CAN)	
32	3-747-173-01	RING (CHI), NAME (TYPE CHI)	

5-2. CAB

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Ref.No.	Part
51	1-466
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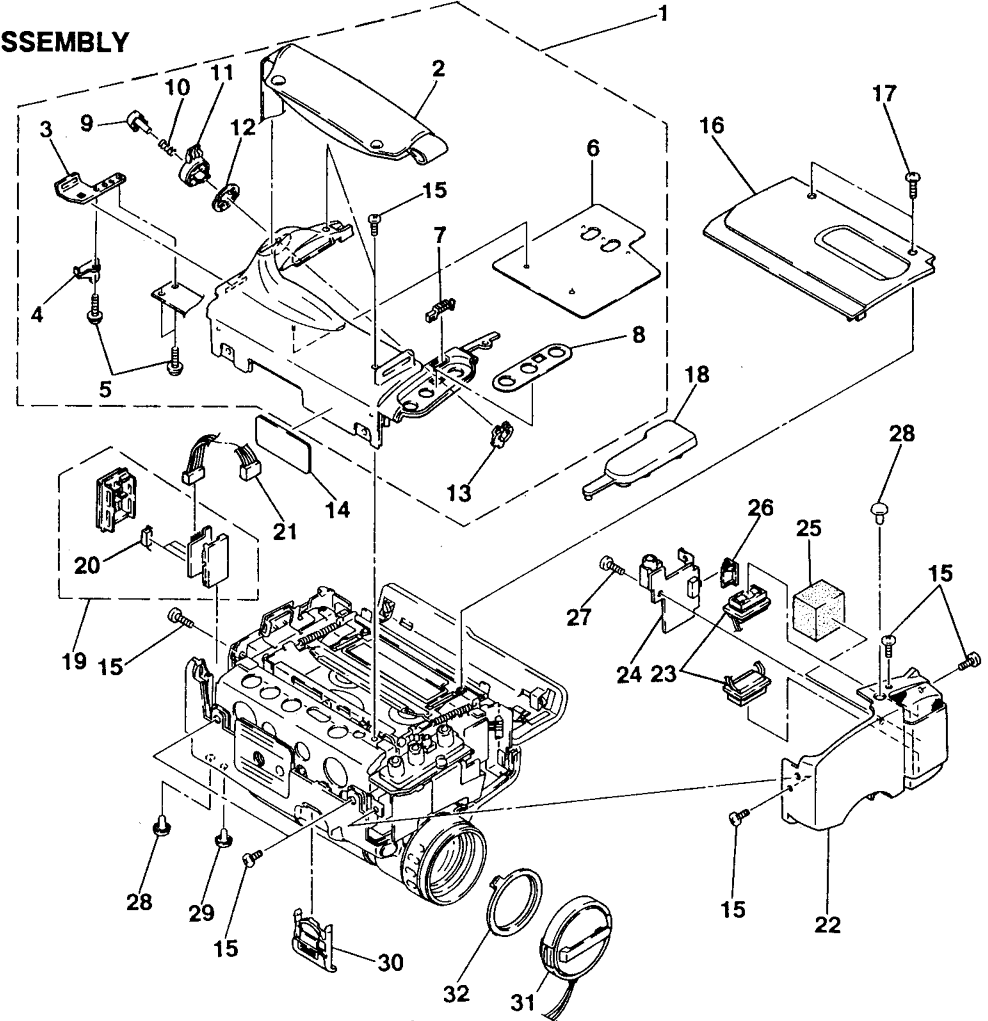
52	3-713
53	1-466
54	*A-707
55	3-719
56	3-719
57	A-708
57	A-708
58	3-747
59	3-747
60	3-747
61	X-374
62	3-719
63	3-747

SECTION 5
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

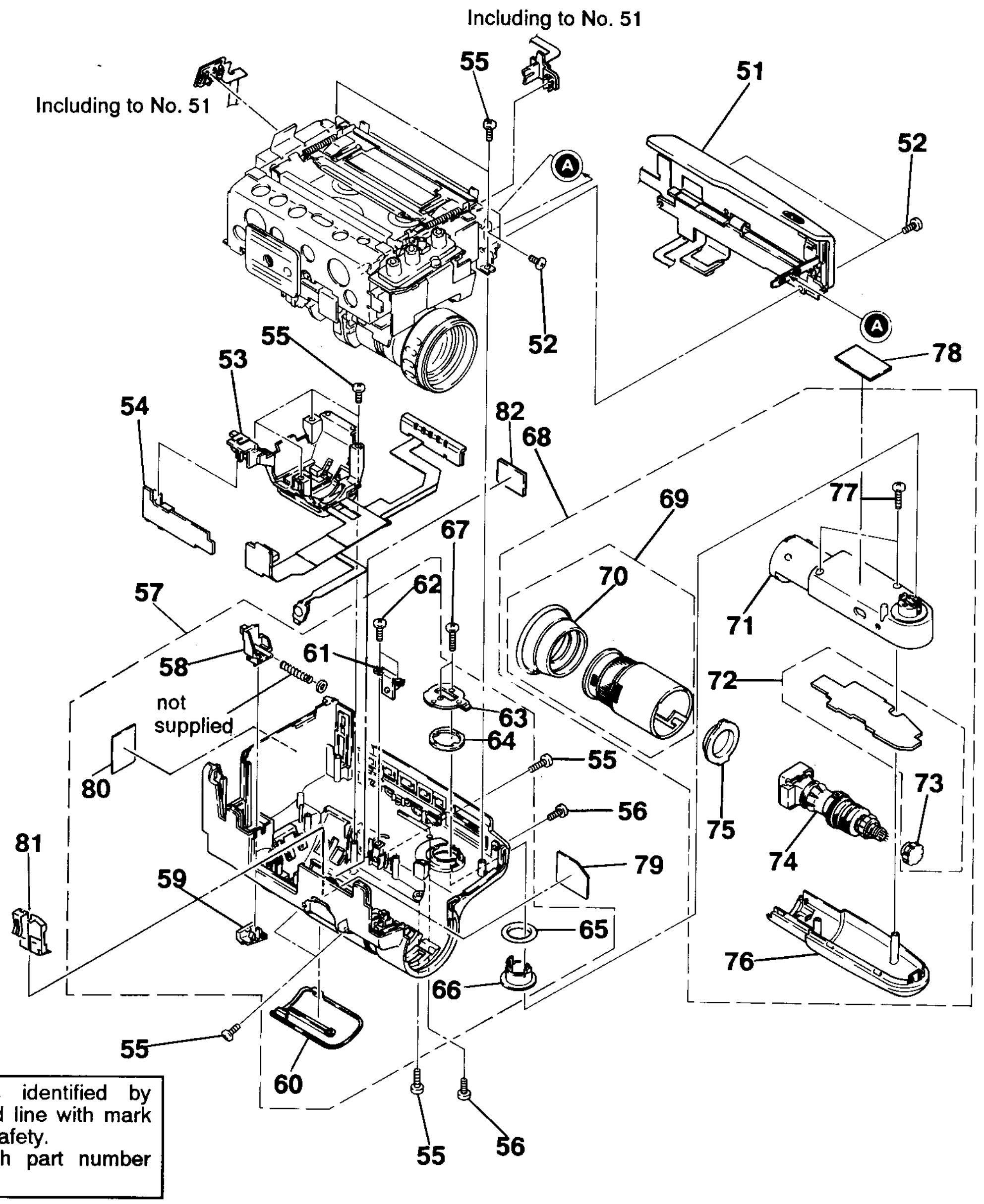
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (L) ASSEMBLY



Ref.No.	Part No.	Description	Remark
1	A-7081-259-A	CABINET (L) BLOCK ASSY (E, Australian MODEL)	2-13, 31
1	A-7081-375-A	CABINET (L) BLOCK ASSY (AEP, UK MODEL)	2-13, 31
2	3-736-807-01	BELT, GRIP	
3	3-736-338-01	BRACKET, BELT	
4	3-736-360-01	JOINT, LR	
5	3-669-480-11	+ PTPWH 2	
6	3-747-128-01	COVER (S), DRUM	
7	3-747-118-01	KNOB, IN-OUT (E, Australian MODEL)	
7	3-749-704-01	LID, IN OUT (AEP, UK MODEL)	
8	3-747-134-21	COVER, I/O	
9	3-736-343-01	BUTTON, S/S	
10	3-578-221-00	SPRING, COMPRESSION	
11	3-736-391-01	KNOB, STAND-BY	
12	3-736-364-01	SPRING	
13	3-736-344-01	HOLDER, STAND-BY KNOB	
14	*3-749-868-01	LABEL, MODEL NUMBER (AEP) (AEP MODEL)	
14	*3-940-446-01	LABEL, MODEL NUMBER (UK) (UK, E, Australian MODEL)	
15	3-719-381-01	SCREW (M2X4)	
16	X-3749-171-1	LID ASSY, CASSETTE	
17	3-727-902-11	SCREW (M1.4), SPECIAL	
18	3-747-145-01	COVER, JACK	
19	1-537-296-31	TERMINAL BOARD (BATTERY)	20
20	⚠ 1-532-841-41	LINK, IC (1.6A)	
21	1-944-055-11	HARNESS (CD-26)	
22	X-3747-116-1	PANEL ASSY, F	
23	1-542-126-21	MICROPHONE UNIT	
24	*A-7062-409-A	MA-65 BOARD, COMPLETE	
25	3-747-132-01	CUSHION (H)	
26	3-747-122-01	KNOB, WINDOW	
27	3-719-601-01	SCREW (B2X5), TAPPING	
28	3-728-267-01	COVER, 3.5 JACK (EARPHONE/MIC)	
29	3-728-266-01	COVER, 2.5 JACK (REMOTE)	
30	3-747-174-01	LID, BATTERY CASE, LITHIUM	
31	A-7091-015-B	CAP ASSY, LENS	
32	3-747-143-01	RING (CAN), NAME (TYPE CAN)	
32	3-747-173-01	RING (CHI), NAME (TYPE CHI)	

5-2. CABINET (R) ASSEMBLY

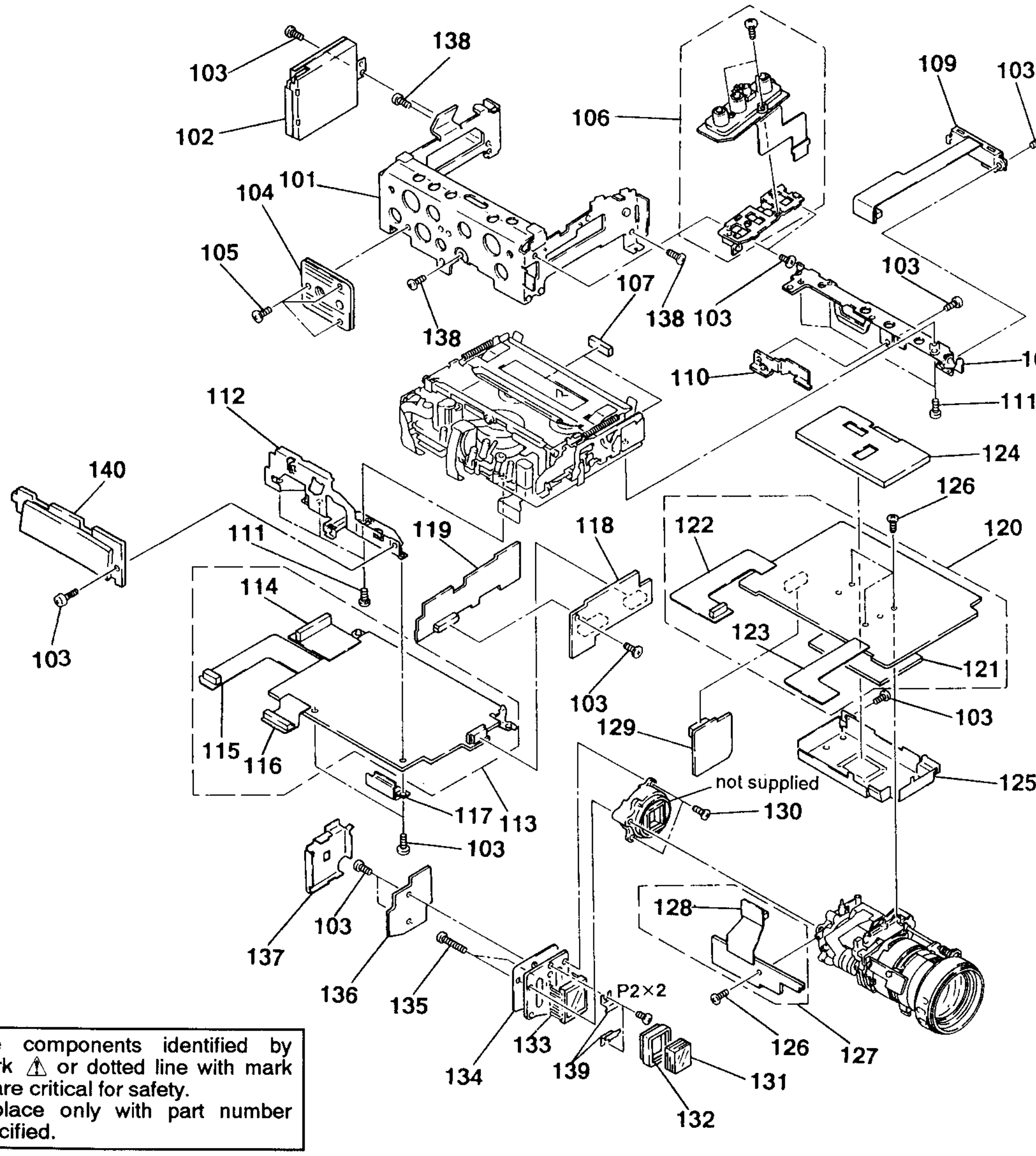


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
51	1-466-362-51	SWITCH BLOCK, CONTROL (FK-1) (E, Australian MODEL)	
51	1-466-417-11	SWITCH BLOCK, CONTROL (FK-1) (AEP, UK MODEL)	
52	3-713-786-51	SCREW (M2X3)	
53	1-466-361-41	SWITCH BLOCK, CONTROL (CF-1)	
54	*A-7071-282-A	EL-10 BOARD, COMPLETE	
55	3-719-408-01	SCREW (B2), TAPPING, P3	
56	3-719-381-01	SCREW (M2X4)	
57	A-7081-373-A	CABINET (R) BLOCK ASSY (AEP, UK MODEL)	58-66, 80
57	A-7081-453-A	CABINET (R) BLOCK ASSY (E, Australian MODEL)	58-66, 80
58	3-747-164-01	LEVER, RELEASE	
59	3-747-163-01	BUTTON, RELEASE	
60	3-747-162-01	LID, SLIDE	
61	X-3747-102-1	PIN ASSY, EVF LOCK	
62	3-719-601-01	SCREW (B2X5), TAPPING	
63	3-747-111-01	PLATE, LOCK, TILT	
64	3-747-110-01	SPRING, LEAF, TILT	
65	3-747-112-01	RING, TILT	
66	3-747-109-01	SLEEVE, EVF	
67	3-740-546-11	SCREW (M2X10.5)	
68	A-7019-264-A	EVF COMPLETE ASSY	69-77
69	A-7081-256-A	HOLDER BLOCK ASSY, FINDER	70
70	3-736-370-01	EYE CUP	
71	X-3747-105-1	CABINET (L) ASSY, EVF	
72	*A-7062-408-A	VF-40 BOARD, COMPLETE	73
73	⚠ 1-540-019-21	SOCKET ASSY, CRT (W951)	
74	⚠ 1-452-482-31	CRT ASSY (M01JYZ60WB) (V901)	
75	3-747-116-01	COVER, CRT	
76	3-747-149-01	CABINET (R), EVF	
77	3-713-790-31	SCREW (M2X8), TAPPING, P3	
78	*3-704-235-01	LABEL, CAUTION (UK MODEL)	
79	3-747-157-01	SHEET (T), PROTECTION	
80	*3-719-683-01	LABEL, BATTERY FITTING	
81	1-537-295-31	TERMINAL BOARD, LITHIUM	
82	3-940-060-01	COVER, TERMINAL BOARD	

Be sure to read "Precations for Replacement of CCD Imager" on page 128 when changing the CCD imager.

5-3. MAIN BOARDS AND CAMERA ASSEMBLIES



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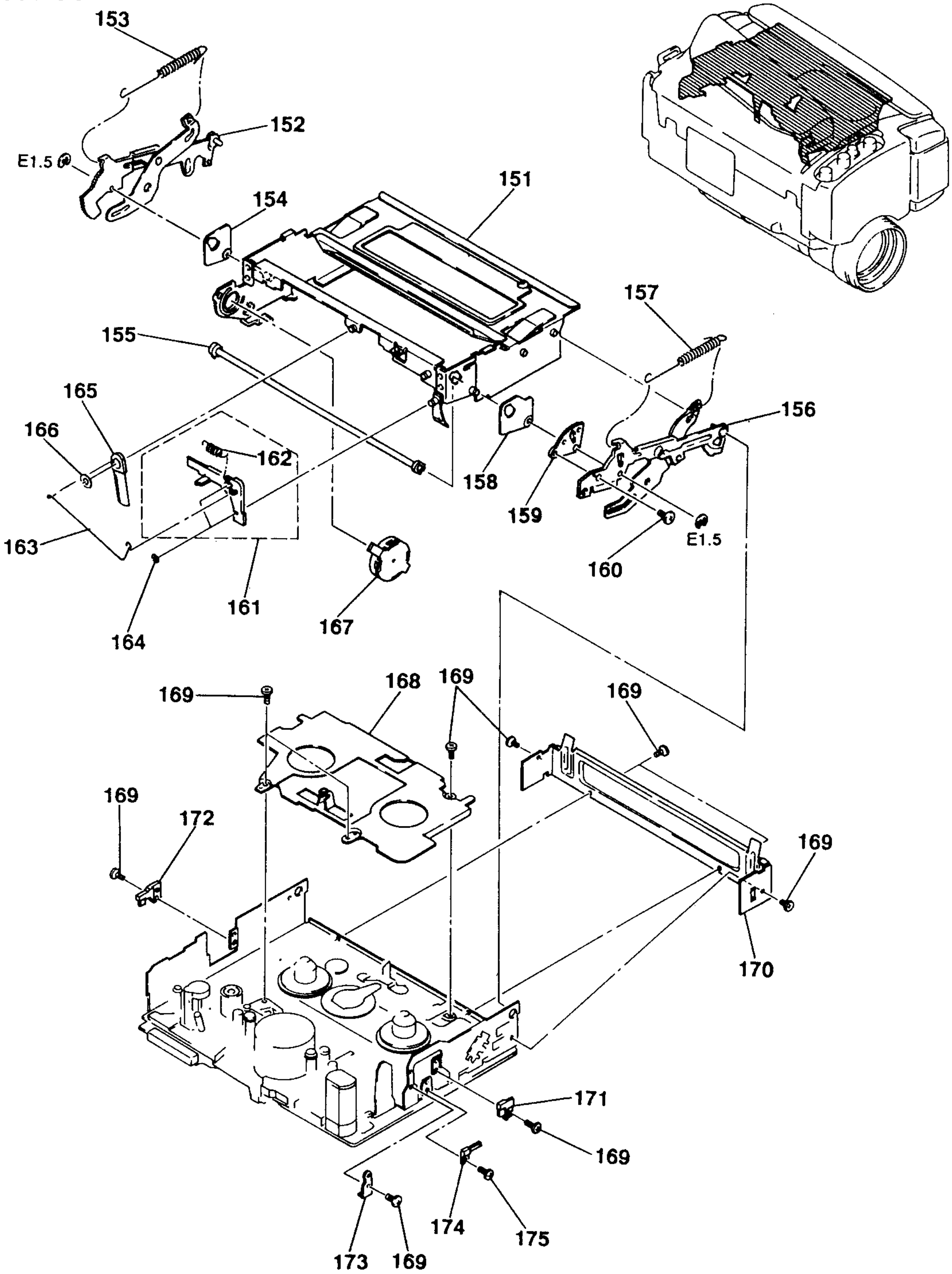
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
101	X-3736-310-2	FRAME ASSY, MD	
102	⚠ A-7062-247-A	DD-30 BOARD, COMPLETE (DC-DC CONVERTER UNIT)	
103	3-713-786-51	SCREW (M2X3)	
104	3-736-396-02	SCREW, TRIPOD	
105	3-719-381-01	SCREW (M2X4)	
106	1-569-777-11	JACK ASSY, PIN	
107	*3-736-841-02	SPACER, FK	
108	*3-747-165-01	SHEET METAL (F), MD FITTING	
109	1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL	
110	*3-747-119-01	REINFORCEMENT, LCD	
111	3-704-197-21	SCREW (M1.4X2.5), LOCKING	
112	3-736-804-01	SHEET METAL (R), MD FITTING	
113	*A-7062-404-A	VS-67 BOARD, COMPLETE (AEP, UK MODEL)	114-116
113	*A-7062-482-A	VS-67 BOARD, COMPLETE (E, Australian MODEL)	114-116
114	1-630-590-11	FP-181 FLEXIBLE BOARD	
115	1-630-592-11	FP-184 FLEXIBLE BOARD (W604)	
116	1-630-591-11	FP-182 FLEXIBLE BOARD	
117	3-736-323-01	SHIELD, RP CONNECTOR	
118	*A-7062-403-A	AU-86 BOARD, COMPLETE	
119	*A-7062-402-A	AU-85 BOARD, COMPLETE	
120	*A-7062-406-A	VC-80 BOARD, COMPLETE	121-123
121	A-7068-175-A	DT-77J BOARD, COMPLETE (HIC)	
122	1-635-395-11	FP-351 FLEXIBLE BOARD	
123	1-635-396-11	FP-362 FLEXIBLE BOARD	
124	*3-736-320-02	CASE (LOWER), VC SHIELD	
125	*3-747-166-01	CASE (UPPER), SHIELD, VC	
126	3-719-601-01	SCREW (B2X5), TAPPING	
127	*A-7062-405-A	LD-33 BOARD, COMPLETE	128
128	1-630-595-21	FP-187 FLEXIBLE BOARD (W701)	
129	*A-7062-407-A	TI-30 BOARD, COMPLETE	
130	3-738-519-11	SCREW (M2X3), +B	
131	1-547-381-12	FILTER BLOCK, OPTICAL (OFB-02-03)	
132	*3-725-177-01	RUBBER, SEAL	
133	8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (IC901)	
134	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
135	3-747-151-01	SCREW (2X16)	
136	*A-7071-281-A	CD-43 BOARD, COMPLETE	
137	*3-736-321-01	CASE, CCD SHIELD	
138	3-719-381-31	SCREW (M2X3)	
139	*3-725-175-01	STOPPER, CCD	
140	*A-7061-855-A	PD-18 BOARD, COMPLETE	

5-4. CASSETTE COMPARTMENT HOLDER ASSEMBLY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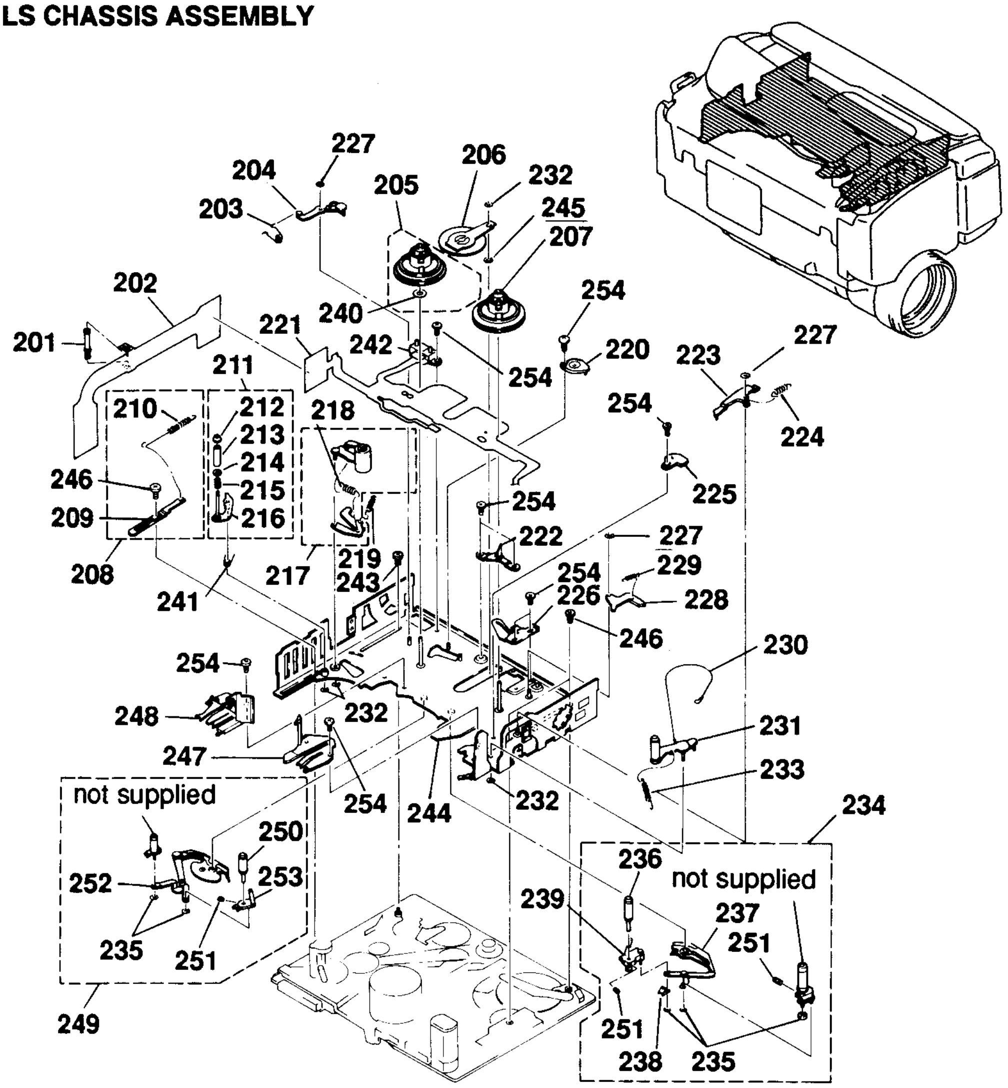
Ref.No.	Part No.	Description	Remark
151	X-3739-807-5	HOLDER ASSY (2)	
152	X-3739-814-1	ARM (TAKE-UP) ASSY (2), F	
153	3-739-872-01	SPRING, TENSION	
154	3-728-145-01	BEARING (T), MIDWAY GEAR	
155	X-3727-920-1	GEAR ASSY, MIDWAY	
156	X-3739-815-2	ARM (SUPPLY) ASSY (2), F	
157	3-739-873-01	SPRING, TENSION	
158	3-728-146-01	BEARING (S), MIDWAY GEAR	
159	3-739-808-02	PLATE (2), ADJUSTMENT, C ARM	
160	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
161	A-7040-164-A	ARM BLOCK ASSY, TP	162
162	3-667-309-00	SPRING, TENSION	
163	3-728-277-01	BAR, JOINT	
164	3-331-007-11	WASHER	
165	X-3727-922-2	PROTECTOR ASSY, T	
166	3-749-304-01	WASHER, STOPPER	
167	X-3739-809-1	DAMPER ASSY (2)	
168	3-728-227-01	BASE, LED	
169	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
170	3-736-808-03	FRAME (2), LS	
171	3-727-957-01	HOLDER (S), SENSOR	
172	3-727-954-01	HOLDER (T), SENSOR	
173	3-727-946-01	SUPPORT, LS	
174	1-554-938-11	SWITCH, LEAF (S991)	
175	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	

5-5. LS CHASSIS ASSEMBLY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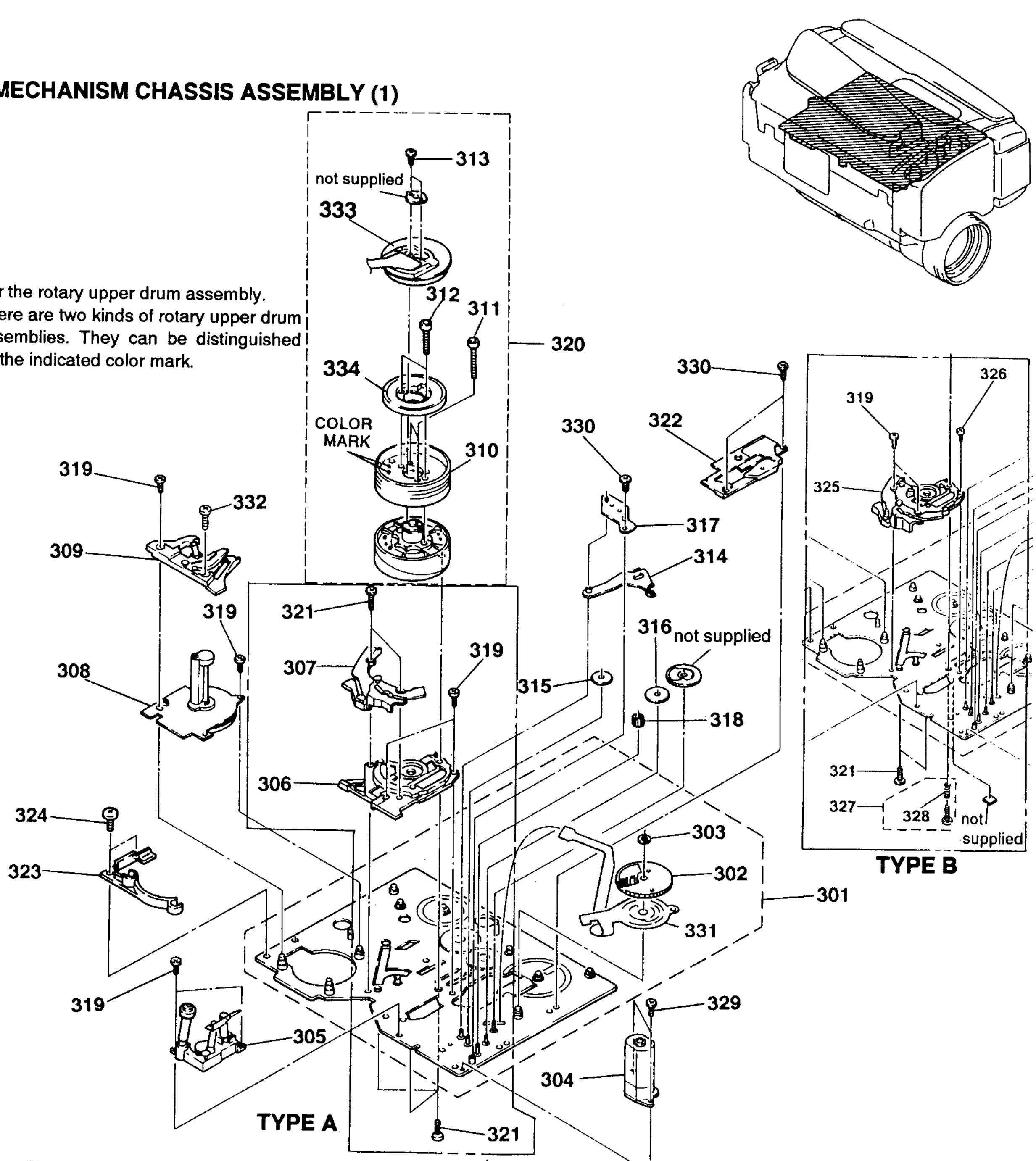
Ref.No.	Part No.	Description	Remark
201	3-739-807-01	SHAFT (2), FLEXIBLE ROTARY	
202	1-627-722-11	FP-149 FLEXIBLE BOARD	
203	3-732-068-01	SPRING (JD), RATCHET	
204	X-3728-005-1	RATCHET ASSY (JD), T	
205	X-3727-951-2	TABLE ASSY, REEL, TAKE-UP	240
206	X-3727-926-1	ARM ASSY, GEAR	
207	X-3727-952-1	TABLE ASSY, REEL, SUPPLY	
208	A-7040-150-A	SLIDER BLOCK ASSY, CAM	209, 210
209	3-728-089-01	SLIDER, CAM	
210	3-727-936-01	SPRING, TENSION	
211	A-7040-151-A	ARM BLOCK ASSY, TG11	212-216
212	3-728-131-02	FLANGE, UPPER, TG11	
213	3-728-133-02	SLEEVE, TG11	
214	3-728-069-02	FLANGE, LOWER, TG11	
215	3-732-040-01	SPRING, COMPRESSION	
216	X-3727-913-2	ARM ASSY, TG11	
217	A-7040-240-A	ARM BLOCK ASSY (JD), PINCH	218
218	3-727-927-01	SPRING (POWER TENSION),TENSION	
219	3-732-089-01	SPRING (JD), TENSION	
220	X-3727-914-4	CLUTCH ASSY, ONEWAY	
221	*A-7061-238-A	FP-115 FLEXIBLE BOARD, COMPLETE	242
222	X-3940-087-1	BASE ASSY, RL	
223	3-732-077-01	RATCHET (JD), S	
224	3-732-076-01	SPRING (JD), TENSION	
225	3-728-200-05	ADJUSTMENT BLOCK, TG1	
226	3-728-206-01	PLATE, CAM, LS	
227	3-728-091-01	WASHER, STOPPER	
228	3-732-079-01	ARM (JD), S SOFT	
229	3-732-078-01	SPRING (JD), TENSION	
230	X-3727-923-3	STRING ASSY	225
231	X-3749-001-1	ARM ASSY (JD), TG1	230
232	3-315-414-31	WASHER	
233	3-940-616-01	SPRING (JD), TENSION	
234	A-7040-211-B	ARM (S) BLOCK ASSY (2), GUIDE	235-239, 251
235	3-331-007-11	WASHER	
236	X-3727-935-2	ROLLER ASSY, TG5	
237	X-3727-941-1	ARM (S) ASSY, GUIDE	
238	3-728-062-01	SPRING (6GB), LEAF	
239	X-3727-948-1	BASE ASSY, TG6	
240	3-701-439-11	WASHER	
241	3-727-939-01	SPRING, TORSION	
242	1-571-647-11	SWITCH, PUSH (2 KEY) (S992)	
243	3-732-085-01	SCREW (1.2X1.6), SPECIAL HEAD	
244	X-3727-993-1	CHASSIS ASSY, LS	
245	3-321-394-01	WASHER	
246	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
247	3-728-226-01	RAIL (S) (JD), GUIDE	
248	3-728-244-01	RAIL (T), GUIDE	
249	A-7040-148-A	ARM (T) BLOCK ASSY, GUIDE	235, 250-253
250	X-3727-994-1	ROLLER ASSY, TG8	
251	3-728-290-01	SCREW (M1.2)	
252	X-3727-940-1	ARM (T) ASSY, GUIDE	
253	X-3727-947-1	BASE ASSY, TG7	
254	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	

5-6. MECHANISM CHASSIS ASSEMBLY (1)

Note: For the rotary upper drum assembly. There are two kinds of rotary upper drum assemblies. They can be distinguished by the indicated color mark.


313
not supplied
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COLOR MARK
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316 not supplied
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328
not supplied
TYPE B
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304
TYPE A
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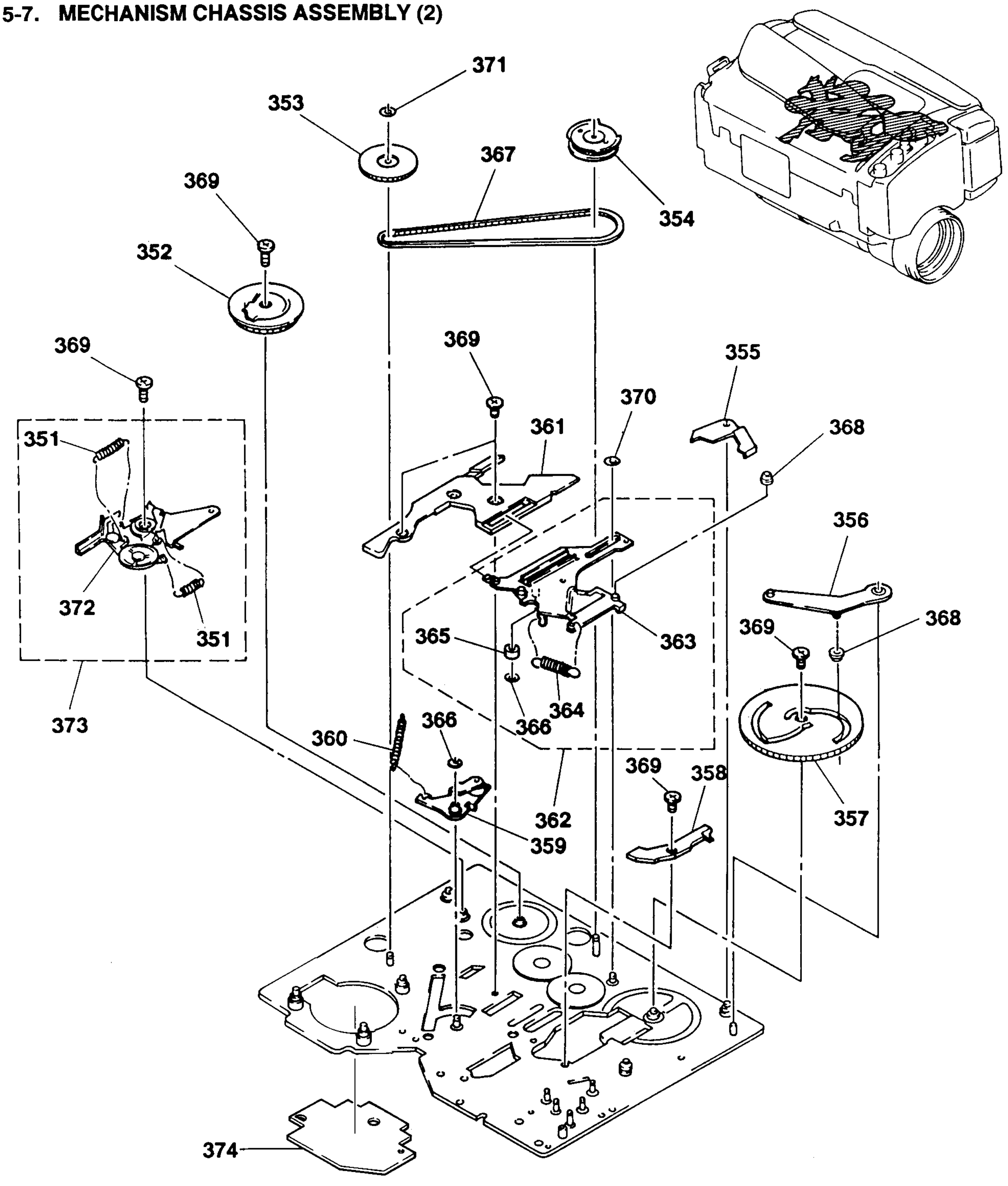
Ref.No.	Part No.	Description	Remark
301	A-7040-154-A	CHASSIS ASSY, MECHANICAL	302, 303, 331
302	X-3727-915-1	GEAR ASSY, MODE	
303	3-325-290-21	WASHER, STOPPER	
304	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING) (M903)	
305	A-7040-209-A	BASE (1) BLOCK ASSY (2), RAIL	
306	X-3727-949-1	BASE ASSY, DRUM (TYPE A)	
307	A-7040-171-C	BASE (2) BLOCK ASSY, GUIDE RAIL (TYPE A)	
308	8-835-329-01	MOTOR, DC U-21A (CAPSTAN) (M902)	
309	X-3727-933-3	BASE (3) ASSY, GUIDE RAIL	
310	A-7049-197-A	DRUM ASSY, UPPER, ROTARY (DGR-37-R-(1)) MARKING; GREEN, BLACK, GREENISH-BROWN, BLACKISH-BROWN	
310	A-7049-198-A	DRUM ASSY, UPPER, ROTARY (DGR-37-R-(2)) MARKING; RED, BLUE, REDDISH-BROWN, BLUISH-BROWN	
311	3-727-809-01	SCREW (M1. 4X5), HEXAGONAL HOLE	
312	3-727-807-01	SCREW (M1. 7X3. 3), HEXAGONAL HOLE	
313	3-728-108-21	SCREW (M1. 4X2. 7)	
314	X-3727-906-1	ARM ASSY	
315	X-3727-903-1	GEAR ASSY, NO. 1	
316	X-3727-904-1	GEAR ASSY, NO. 2	
317	3-728-119-01	RETAINER, GEAR	
318	3-728-149-01	GEAR, NO. 0	
319	3-728-148-01	SCREW (M1. 4X2. 5), SPECIAL HEAD	
320	A-7048-214-A	DRUM BLOCK ASSY (DGH-37A-R) (M901)	310-313, 333, 334
321	3-728-108-01	SCREW (M1. 4X4. 5)	
322	3-728-231-01	BASE, TG-1 CAM	
323	3-732-064-01	COVER, ROTOR	
324	3-728-126-01	SCREW (M1. 4X2), SPECIAL HEAD	
325	*A-7040-203-C	BASE (A) BLOCK ASSY, DRUM (TYPE B)	
326	3-703-816-51	SCREW (M1. 4X3. 5), SPECIAL HEAD (TYPE B)	
327	X-3728-009-2	SCREW ASSY, FITTING (TYPE B)	328
328	3-743-633-01	SPRING, COMPRESSION (TYPE B)	
329	3-732-087-31	SCREW (M1. 4X1. 8), SPECIAL HEAD	
330	3-728-148-11	SCREW (M1. 4X2. 5), SPECIAL HEAD	
331	*1-627-721-16	FP-114 FLEXIBLE BOARD	
332	3-732-084-01	SCREW (M1. 4), SPECIAL HEAD	
333	A-7049-220-C	MOTOR ASSY (STATOR)	
334	A-7049-219-A	MOTOR ASSY (ROTOR)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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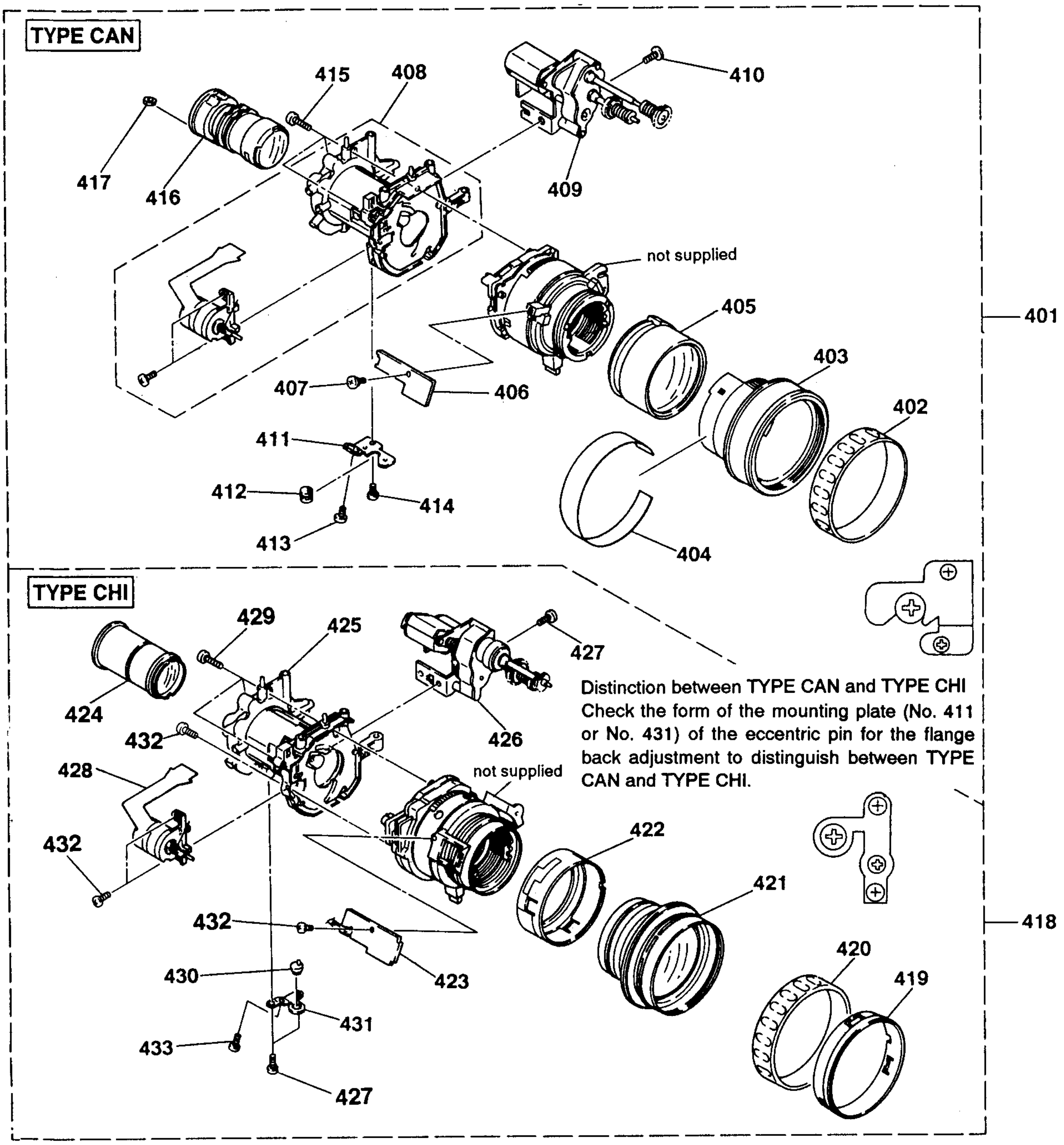
Ref.No.	Part No.	Description	Remark
351	3-728-065-01	SPRING, TENSION	
352	3-728-190-01	CAM (B)	
353	X-3727-930-1	GEAR ASSY, CONVERSION	
354	X-3727-931-1	PULLEY ASSY, MIDWAY	
355	3-728-154-01	ARM, EJ	
356	X-3727-916-1	ARM ASSY, LS	
357	3-728-208-02	CAM (A)	
358	3-728-213-01	SUPPORT (S), GL	
359	X-3727-924-2	ARM ASSY, GUIDE LOCK	
360	3-728-015-01	SPRING (POWER TENSION), TENSION	
361	3-728-228-03	SUPPORT (T), GL	
362	A-7040-153-A	SLIDER BLOCK ASSY, GL	363-366
363	X-3727-942-1	SLIDER ASSY, GL	
364	3-727-929-01	SPRING (POWER TENSION), TENSIOI	
365	3-728-144-01	ROLLER, GL	
366	3-331-007-11	WASHER	
367	3-728-212-01	BELT, RELAY	
368	3-728-109-01	ROLLER, LS	
369	3-728-148-11	SCREW (M1.4X2.5), SPECIAL HEAI	
370	3-315-384-31	WASHER, STOPPER	
371	3-728-091-01	WASHER, STOPPER	
372	X-3727-944-1	ARM ASSY, PINCH PRESS	
373	A-7040-152-A	ARM BLOCK ASSY, PINCH PRESS	351, 372
374	3-743-631-01	COVER	

5-8. ZOOM LENS ASSEMBLIES


TYPE CAN
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not supplied
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TYPE CHI
429
425
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424
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not supplied
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Distinction between TYPE CAN and TYPE CHI
Check the form of the mounting plate (No. 411 or No. 431) of the eccentric pin for the flange back adjustment to distinguish between TYPE CAN and TYPE CHI.

Ref.No.	Part No.	Description	Remark
401	1-547-419-11	LENS, ZOOM (VCL-8508XH) (TYPE CAN)	402-417
402	3-707-996-01	RUBBER, F	
403	3-708-005-01	RING, F	
404	3-707-997-01	SHEET, F	
405	3-708-006-01	LENS ASSY, F	
406	3-707-998-01	SENSOR ASSY, F	
407	3-707-999-01	SCREW, F SENSOR FITTING	
408	3-707-993-01	MIRROR TUBE ASSY, REAR	
409	3-707-994-01	MOTOR ASSY (FOCUS/ZOOM) (M905)	
410	3-707-995-01	SCREW, MOTOR FITTING	
411	3-708-003-01	RETAINER, ECCETRIC PIN	
412	3-708-001-01	PIN, ECCENTRIC	
413	3-708-002-01	SCREW, FB LOCK	
414	3-708-004-01	SCREW, FB FITTING	
415	3-707-992-01	SCREW, DOCKING	
416	3-707-991-01	LENS ASSY, RELAY	
417	3-707-990-01	NUT, FB	

Ref.No.	Part No.	Description	Remark
418	1-547-420-11	LENS, ZOOM (VCL-8508XI) (TYPE CHI)	419-433
419	3-708-029-01	RING, DISTANCE	
420	3-708-028-01	RUBBER RING, DISTANCE	
421	3-708-027-01	LENS ASSY, F	
422	3-708-026-01	RING, DISTANCE STOPPER	
423	3-708-020-01	SENSOR ASSY, F	
424	3-708-013-01	FRAME ASSY, MASTER	
425	3-708-014-01	RETAINER ASSY, MASTER	
426	3-708-016-01	MOTOR ASSY (FOCUS/ZOOM) (M905)	
427	3-708-017-01	SCREW, FITTING, MOTOR. FB	
428	3-708-018-01	METER ASSY, IRIS (IRIS) (M904)	
429	3-708-015-01	SCREW (A), DICKING	
430	3-708-022-01	PIN, ECCENTRIC	
431	3-708-023-01	SHEET METAL (FB)	
432	3-708-024-01	SCREW (B), DOCKING	
433	3-708-025-01	SCREW (FB), FIXED	

SECTION 6
ELECTRICAL PARTS LIST

FP-115 **PD-18**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- SEMICONDUCTORS
  In each case, U: μ, for example:
  UA...: μA..., UPA...: μPA..., UPB...: μPB..., UPC...: μPC..., UPD...: μPD...
- CAPACITORS
  MF : μF, PF : μμF
- COILS
  MMH : mH, UH : μH

Ref.No.	Part No.	Description	Remark
	*A-7061-238-A	FP-115 BOARD, COMPLETE (Ref. No. 8,000 series) **********************	
	3-727-954-01	HOLDER (T), SENSOR	
	3-727-957-01	HOLDER (S), SENSOR	
	3-732-046-01	HOLDER, LED	
		DIODE	
D991	8-719-951-03	DIODE GL453	
		ELEMENT HALL	
H991	1-808-448-11	ELEMENT, HALL (CHIP TYPE)	
H992	1-808-448-11	ELEMENT, HALL (CHIP TYPE)	
		TRANSISTOR	
Q991	8-729-907-25	TRANSISTOR PT4850F (TAPE TOP)	
Q992	8-729-907-25	TRANSISTOR PT4850F (TAPE END)	
		RESISTOR	
R991	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R992	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R993	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R994	1-216-817-11	METAL GLAZE 470 5% 1/16W	
		SWITCH	
S991	1-554-938-11	SWITCH, LEAF (CASSETTE LOCK)	
S992	1-571-647-11	SWITCH, PUSH (2 KEY) (REC PROOF, ME/MP)	

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Ref.No.	Part No.	Description	Remark
	*A-7061-855-A	PD-18 BOARD, COMPLETE (Ref. No. 4,000 series) **********************	
		CAPACITOR	
C201	1-163-086-00	CERAMIC CHIP 3PF 0.25PF 50V	
C202	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C203	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C204	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C205	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C206	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
C207	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C208	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C209	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C210	1-164-182-11	CERAMIC CHIP 0.0033MF 10% 50V	
C211	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C212	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	

Ref.No.	Part No.	Description	Remark
C213	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C214	1-135-157-21	TANTAL. CHIP 10MF 20%	6.3V
		DIODE	
D201	8-719-800-76	DIODE 1SS226	
		FILTER	
FL201	1-236-188-11	FILTER, BAND PASS	
FL202	1-415-664-11	DELAY LINE, ULTRASONIC 2H	
		COIL	
L201	1-410-383-31	INDUCTOR CHIP 15UH	
L202	1-410-385-11	INDUCTOR CHIP 22UH	
L203	1-412-029-11	INDUCTOR CHIP 10UH	
		TRANSISTOR	
Q201	8-729-100-66	TRANSISTOR 2SC1623	
Q202	8-729-100-66	TRANSISTOR 2SC1623	
Q203	8-729-100-66	TRANSISTOR 2SC1623	
Q204	8-729-100-66	TRANSISTOR 2SC1623	
Q205	8-729-100-66	TRANSISTOR 2SC1623	
Q206	8-729-100-66	TRANSISTOR 2SC1623	
Q207	8-729-100-66	TRANSISTOR 2SC1623	
Q208	8-729-100-66	TRANSISTOR 2SC1623	
		RESISTOR	
R201	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R202	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R203	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R204	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R205	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R206	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R207	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R208	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R209	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R210	1-216-039-00	METAL GLAZE 390 5% 1/10W	
R211	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R212	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R213	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R214	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R215	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R216	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R217	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R218	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R219	1-216-027-00	METAL GLAZE 120 5% 1/10W	
R220	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	

Ref.No.	Part No.	Description	Remark
R221	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R222	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R223	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R224	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R225	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R226	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R227	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R228	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R229	1-216-079-00	METAL GLAZE 18K 5% 1/10W	

VARIABLE RESISTOR

Ref.No.	Part No.	Description	Remark
RV201	1-238-089-11	RES, ADJ CERMET 4.7K	

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*A-7062-402-A AU-85 BOARD, COMPLETE (Ref. No. 6,000 series)
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CAPACITOR

Ref.No.	Part No.	Description	Remark
C700	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C701	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C702	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C703	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C704	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C705	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C706	1-162-968-11	CERAMIC CHIP 0.0047MF 10% 50V	
C707	1-162-587-11	CERAMIC CHIP 0.039MF 10% 25V	
C708	1-128-003-11	ELECT CHIP 22MF 20% 4V	
C709	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C710	1-162-910-11	CERAMIC CHIP 5PF 0.25PF 50V	
C711	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C712	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V	
C713	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C714	1-162-923-11	CERAMIC CHIP 47PF 5% 50V	
C715	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C716	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C717	1-164-362-11	CERAMIC CHIP 470PF 50V	
C718	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C719	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C720	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C721	1-126-607-11	ELECT CHIP 47MF 20% 4V	
C722	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C723	1-162-910-11	CERAMIC CHIP 5PF 0.25PF 50V	
C725	1-162-956-11	CERAMIC CHIP 180PF 5% 50V	
C726	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C727	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C728	1-162-965-11	CERAMIC CHIP 0.0015MF 10% 50V	
C729	1-163-016-00	CERAMIC CHIP 0.0039MF 10% 50V	
C730	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C731	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C732	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	
C733	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C734	1-135-145-11	TANTAL. CHIP 0.47MF 20% 35V	
C735	1-162-965-11	CERAMIC CHIP 0.0015MF 10% 50V	
C736	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C738	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C740	1-126-607-11	ELECT CHIP 47MF 20% 4V	
C741	1-126-206-11	ELECT CHIP 100MF 20% 6.3V	
C742	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C743	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C744	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C745	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C746	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C747	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C748	1-162-587-11	CERAMIC CHIP 0.039MF 10% 25V	
C749	1-162-968-11	CERAMIC CHIP 0.0047MF 10% 50V	
C750	1-126-607-11	ELECT CHIP 47MF 20% 4V	
C751	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C752	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C753	1-128-003-11	ELECT CHIP 22MF 20% 4V	
C754	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V	
C755	1-162-910-11	CERAMIC CHIP 5PF 0.25PF 50V	
C756	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C757	1-164-362-11	CERAMIC CHIP 470PF 50V	
C758	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C759	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C761	1-162-910-11	CERAMIC CHIP 5PF 0.25PF 50V	
C763	1-162-923-11	CERAMIC CHIP 47PF 5% 50V	
C764	1-162-956-11	CERAMIC CHIP 180PF 5% 50V	
C765	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C766	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C767	1-162-965-11	CERAMIC CHIP 0.0015MF 10% 50V	
C768	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C769	1-163-016-00	CERAMIC CHIP 0.0039MF 10% 50V	
C770	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C771	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	
C772	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C773	1-135-145-11	TANTAL. CHIP 0.47MF 20% 35V	
C774	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C775	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C777	1-162-923-11	CERAMIC CHIP 47PF 5% 50V	
C778	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C779	1-162-965-11	CERAMIC CHIP 0.0015MF 10% 50V	
C780	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C781	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C782	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C783	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C784	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C785	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN701	1-568-361-41	CONNECTOR, BOARD TO BOARD 24P	
CN702	1-569-775-21	PIN, CONNECTOR 5P	

When indicating parts by reference number, please include the board name.

IC

Ref.No.	Part No.	Description	Remark
IC701	8-752-033-01	IC CXA1237AR	
IC702	8-759-100-95	IC UPC324G2	
IC703	8-759-932-54	IC MC14066BF	
IC704	8-752-033-01	IC CXA1237AR	

COIL

Ref.No.	Part No.	Description	Remark
L701	1-410-658-31	INDUCTOR CHIP 220UH	
L702	1-410-658-31	INDUCTOR CHIP 220UH	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q713	8-729-402-42	TRANSISTOR UN5213	
Q716	8-729-421-90	TRANSISTOR XN4113	
Q718	8-729-117-32	TRANSISTOR 2SC4177	

RESISTOR

Ref.No.	Part No.	Description	Remark
R701	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R702	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R703	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R704	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R705	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R706	1-216-688-11	METAL CHIP 36K 0.50% 1/10W	
R707	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R708	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R709	1-216-688-11	METAL CHIP 36K 0.50% 1/10W	
R710	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R711	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R712	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R713	1-216-688-11	METAL CHIP 36K 0.50% 1/10W	
R714	1-216-797-11	METAL GLAZE 10 5% 1/16W	
R715	1-216-688-11	METAL CHIP 36K 0.50% 1/10W	
R717	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R719	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R720	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R722	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R723	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R724	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R725	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R726	1-216-826-11	METAL GLAZE 2.7K 5% 1/16W	
R727	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R731	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R732	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R733	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R734	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R735	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R736	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R738	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R739	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R740	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R741	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R744	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R745	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R746	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R747	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R748	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R750	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R751	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R752	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R753	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R754	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R755	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R756	1-216-856-11	METAL GLAZE 820K 5% 1/16W	
R757	1-216-826-11	METAL GLAZE 2.7K 5% 1/16W	
R758	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R759	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R760	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R761	1-216-834-11	METAL GLAZE 12K 5% 1/16W	

NETWORK RESISTOR

Ref.No.	Part No.	Description	Remark
RB701	1-236-417-11	NETWORK, RES 2.7K	
RB702	1-236-418-11	NETWORK, RES 3.3K	
RB703	1-236-424-11	NETWORK, RES 10K	
RB704	1-236-411-11	NETWORK, RES 820	
RB705	1-236-427-11	NETWORK, RES 18K	
RB707	1-236-420-11	NETWORK, RES 4.7K	
RB709	1-236-417-11	NETWORK, RES 2.7K	
RB710	1-236-418-11	NETWORK, RES 3.3K	
RB712	1-236-410-11	NETWORK, RES 680	
RB713	1-236-427-11	NETWORK, RES 18K	
RB714	1-236-424-11	NETWORK, RES 10K	
RB715	1-236-420-11	NETWORK, RES 4.7K	

VARIABLE RESISTOR

Ref.No.	Part No.	Description	Remark
RV701	1-238-091-11	RES, ADJ CERMET 22K	
RV702	1-238-090-11	RES, ADJ CERMET 10K	
RV703	1-238-093-11	RES, ADJ CERMET 100K	
RV704	1-238-090-11	RES, ADJ CERMET 10K	
RV705	1-238-090-11	RES, ADJ CERMET 10K	

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Ref.No.	Part No.	Description	Remark
	*A-7062-403-A	AU-86 BOARD, COMPLETE (Ref.No. 6,000 series) **********************	
	3-831-441-99	CUSHION (5)	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C801	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C802	1-162-969-11	CERAMIC CHIP 0.0068MF 10% 25V	
C803	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C804	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	

When indicating parts by reference number, please include the board name.

AU-86

Ref.No.	Part No.	Description	Remark
C805	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C806	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C807	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C808	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C809	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C810	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C811	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C812	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C813	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C814	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C815	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C816	1-124-967-11	ELECT 10MF 20% 10V	
C817	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C818	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C819	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C820	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C822	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C823	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C824	1-124-967-11	ELECT 10MF 20% 10V	
C825	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C826	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C827	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C828	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C829	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C830	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C831	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C832	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C833	1-162-638-11	CERAMIC CHIP 1MF 16V	
C834	1-124-778-00	ELECT CHIP 22MF 20% 6.3V	
C835	1-135-149-21	TANTAL. CHIP 2.2MF 20% 10V	
C836	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C837	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C838	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN801	1-569-732-11	CONNECTOR, BOARD TO BOARD 24P	
CN802	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P	
CN803	1-566-760-11	PIN, CONNECTOR (PC BOARD) 5P	

DIODE

Ref.No.	Part No.	Description	Remark
D801	8-719-404-35	DIODE MA141WK	
D802	8-719-404-35	DIODE MA141WK	
D803	8-719-404-35	DIODE MA141WK	
D805	8-719-404-46	DIODE MA110	
D806	8-719-404-46	DIODE MA110	
D807	8-719-404-35	DIODE MA141WK	
D808	8-719-404-46	DIODE MA110	
D809	8-719-404-32	DIODE MA141WA	

FILTER

Ref.No.	Part No.	Description	Remark
FL801	1-236-837-21	FILTER, BAND PASS (1.5MHz)	
FL802	1-236-838-21	FILTER, BAND PASS (1.7MHz)	

IC

Ref.No.	Part No.	Description	Remark
IC801	8-752-334-42	IC CXD2106Q	
IC802	8-759-981-82	IC RC3414M	
IC803	8-759-932-54	IC MC14066BF	
IC804	8-759-932-54	IC MC14066BF	

COIL

Ref.No.	Part No.	Description	Remark
L801	1-410-389-31	INDUCTOR CHIP 47UH	
L802	1-412-031-11	INDUCTOR CHIP 47UH	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q801	8-729-402-81	TRANSISTOR XN4501	
Q802	8-729-402-81	TRANSISTOR XN4501	
Q804	8-729-402-81	TRANSISTOR XN4501	
Q805	8-729-402-42	TRANSISTOR UN5213	
Q806	8-729-402-81	TRANSISTOR XN4501	
Q807	8-729-402-81	TRANSISTOR XN4501	
Q809	8-729-403-27	TRANSISTOR XN4401	
Q810	8-729-421-90	TRANSISTOR XN4113	
Q811	8-729-403-24	TRANSISTOR XN4210	
Q812	8-729-420-20	TRANSISTOR XN4312	
Q815	8-729-402-81	TRANSISTOR XN4501	
Q816	8-729-117-32	TRANSISTOR 2SC4177	
Q817	8-729-420-12	TRANSISTOR XN4213	
Q819	8-729-403-27	TRANSISTOR XN4401	
Q820	8-729-402-81	TRANSISTOR XN4501	
Q821	8-729-422-54	TRANSISTOR XN4215	
Q822	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q823	8-729-402-42	TRANSISTOR UN5213	

RESISTOR

Ref.No.	Part No.	Description	Remark
R801	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R802	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R803	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R804	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R805	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R806	1-216-659-11	METAL CHIP 2.2K 0.50% 1/10W	
R807	1-216-661-11	METAL CHIP 2.7K 0.50% 1/10W	
R808	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R809	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R810	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R811	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R812	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R813	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R814	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
R815	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R816	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R817	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R818	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R819	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R820	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R821	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R823	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R824	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R825	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R826	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R828	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R829	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R830	1-216-849-11	METAL GLAZE 220K 5% 1/16W	
R831	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R832	1-216-849-11	METAL GLAZE 220K 5% 1/16W	
R833	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R834	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R836	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R837	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R838	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R839	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R840	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R841	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R842	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R843	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R844	1-216-846-11	METAL GLAZE 120K 5% 1/16W	
R845	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R846	1-216-848-11	METAL GLAZE 180K 5% 1/16W	
R847	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R848	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	

NETWORK RESISTOR

Ref.No.	Part No.	Description	Remark
RB801	1-236-412-11	NETWORK, RES 1.0K	
RB802	1-236-418-11	NETWORK, RES 3.3K	
RB803	1-236-436-11	NETWORK, RES 100K	
RB804	1-236-418-11	NETWORK, RES 3.3K	
RB805	1-236-440-11	NETWORK, RES 220K	
RB806	1-236-426-11	NETWORK, RES 15K	
RB807	1-236-416-11	NETWORK, RES 2.2K	
RB808	1-236-436-11	NETWORK, RES 100K	
RB809	1-236-436-11	NETWORK, RES 100K	
RB810	1-236-428-11	NETWORK, RES 22K	
RB811	1-236-412-11	NETWORK, RES 1.0K	
RB812	1-236-424-11	NETWORK, RES 10K	
RB813	1-236-432-11	NETWORK, RES 47K	
RB814	1-236-436-11	NETWORK, RES 100K	
RB815	1-236-436-11	NETWORK, RES 100K	
RB816	1-236-436-11	NETWORK, RES 100K	
RB817	1-236-428-11	NETWORK, RES 22K	
RB818	1-236-436-11	NETWORK, RES 100K	
RB819	1-236-416-11	NETWORK, RES 2.2K	
RB820	1-236-429-11	NETWORK, RES 27K	
RB821	1-236-424-11	NETWORK, RES 10K	

CRISTAL

Ref.No.	Part No.	Description	Remark
X801	1-579-050-11	VIBRATOR, CRYSTAL (150kHz)	

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Ref.No.	Part No.	Description	Remark
	*A-7062-404-A	VS-67 BOARD, COMPLETE (AEP, UK MODEL) ********************* (Ref. No. 5,000 series)	
	*A-7062-482-A	VS-67 BOARD, COMPLETE (E, Australian MODEL) ********************* (Ref. No. 5,000 series)	
	1-630-590-11	PC BOARD, FP-181 FLEXIBLE	
	1-630-591-11	PC BOARD, FP-182 FLEXIBLE	
	*3-736-316-01	CASE (UPPER), RP SHIELD	
	*3-736-317-01	CASE (LOWER), RP SHIELD	
	*3-736-322-01	CASE, FE SHIELD	
	*3-736-324-01	PLATE (LEFT), VS GROUND	
	*3-736-325-01	PLATE (RIGHT), VS GROUND	
	*3-736-887-01	PLATE, SHIELD, PAL DELAY LINE	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C101	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C102	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C104	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C105	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C106	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C107	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C108	1-135-161-21	TANTAL. CHIP 22MF 20% 10V	
C109	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C110	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C111	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C112	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C113	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C114	1-135-180-21	TANTAL. CHIP 3.3MF 20% 6.3V	
C115	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C116	1-135-180-21	TANTAL. CHIP 3.3MF 20% 6.3V	
C117	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C118	1-162-968-11	CERAMIC CHIP 0.0047MF 10% 50V	
C119	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C120	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C121	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C123	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C124	1-162-968-11	CERAMIC CHIP 0.0047MF 10% 50V	
C125	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C126	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C127	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C128	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description			Remark
C129	1-162-945-11	CERAMIC CHIP 22PF	5%	50V	
C130	1-162-945-11	CERAMIC CHIP 22PF	5%	50V	
C131	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C132	1-135-161-21	TANTAL. CHIP 22MF	20%	10V	
C133	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C134	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C135	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C136	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C137	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C138	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V	
C139	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C140	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V	
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C142	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V	
C143	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C144	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C145	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C146	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C147	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C148	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V	
C149	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C150	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C151	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C152	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C161	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C162	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V	
C163	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C164	1-135-161-21	TANTAL. CHIP 22MF	20%	10V	
C165	1-162-948-11	CERAMIC CHIP 39PF	5%	50V	
C166	1-162-963-11	CERAMIC CHIP 680PF	10%	50V	
C167	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C168	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C169	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C170	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C171	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C172	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C173	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C174	1-135-177-21	TANTAL. CHIP 1MF	20%	20V	
C175	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C176	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C177	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C178	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C179	1-135-177-21	TANTAL. CHIP 1MF	20%	20V	
C180	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C181	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C182	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C183	1-135-161-21	TANTAL. CHIP 22MF	20%	10V	
C184	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C185	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C192	1-163-038-00	CERAMIC CHIP 0.1MF		25V	
C193	1-162-953-11	CERAMIC CHIP 100PF	5%	50V	
C194	1-162-927-11	CERAMIC CHIP 100PF	5%	50V	

Ref.No.	Part No.	Description			Remark
C195	1-162-927-11	CERAMIC CHIP 100PF	5%	50V	
C196	1-164-217-11	CERAMIC CHIP 150PF	0.25PF	50V	
C197	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C201	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V	
C203	1-126-205-11	ELECT CHIP 47MF	20%	6.3V	
C204	1-124-779-00	ELECT CHIP 10MF	20%	16V	
C205	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C206	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C207	1-126-246-11	ELECT CHIP 220MF	20%	4V	
C208	1-162-974-11	CERAMIC CHIP 0.01MF		50V	
C209	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C210	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C211	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V	
C212	1-135-146-21	TANTAL. CHIP 0.68MF	20%	25V	
C213	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C214	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C215	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C216	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C217	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V	
C218	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C219	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C220	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C221	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V	
C222	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C223	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C224	1-162-638-11	CERAMIC CHIP 1MF		16V	
C227	1-162-638-11	CERAMIC CHIP 1MF		16V	
C228	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C229	1-162-638-11	CERAMIC CHIP 1MF		16V	
C230	1-162-638-11	CERAMIC CHIP 1MF		16V	
C232	1-162-638-11	CERAMIC CHIP 1MF		16V	
C233	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V	
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C235	1-162-638-11	CERAMIC CHIP 1MF		16V	
C236	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C237	1-162-638-11	CERAMIC CHIP 1MF		16V	
C238	1-162-638-11	CERAMIC CHIP 1MF		16V	
C239	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C240	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C241	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C242	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V	
C243	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C244	1-162-638-11	CERAMIC CHIP 1MF		16V	
C245	1-162-974-11	CERAMIC CHIP 0.01MF		50V	
C246	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V	
C247	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C248	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V	
C249	1-162-638-11	CERAMIC CHIP 1MF		16V	
C251	1-162-953-11	CERAMIC CHIP 100PF	5%	50V	
C252	1-162-937-11	CERAMIC CHIP 6PF	0.5PF	50V	
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C254	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description		Remark
C255	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C256	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C257	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C258	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C259	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C260	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C261	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C262	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C263	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C264	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C266	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C267	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C268	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C269	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C270	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C271	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C272	1-162-950-11	CERAMIC CHIP 56PF	5%	50V
C273	1-162-950-11	CERAMIC CHIP 56PF	5%	50V
C274	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C275	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C276	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C277	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C278	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C279	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C280	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C281	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C282	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C283	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C284	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C285	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C287	1-162-951-11	CERAMIC CHIP 68PF	5%	50V
C288	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C289	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C290	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C291	1-162-638-11	CERAMIC CHIP 1MF		16V
C293	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C294	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C295	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C296	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C297	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C298	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C299	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C301	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C302	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C303	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C304	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C305	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C306	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C307	1-162-952-11	CERAMIC CHIP 82PF	5%	50V
C308	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C310	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C312	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C313	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C314	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C315	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C316	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C317	1-162-917-11	CERAMIC CHIP 15PF	5%	50V
C318	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C319	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C320	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C321	1-162-925-11	CERAMIC CHIP 68PF	5%	50V
C322	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C323	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C324	1-162-952-11	CERAMIC CHIP 82PF	5%	50V
C325	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C326	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C327	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C329	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C330	1-162-939-11	CERAMIC CHIP 8PF	0.5PF	50V
C331	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C333	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C334	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C335	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C336	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C337	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C338	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C340	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C344	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C345	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C346	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C347	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C348	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C349	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C350	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C351	1-135-177-21	TANTAL. CHIP 1MF	20%	20V
C352	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C353	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C354	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C355	1-135-177-21	TANTAL. CHIP 1MF	20%	20V
C356	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C358	1-162-638-11	CERAMIC CHIP 1MF		16V
C359	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C366	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C370	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C371	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C374	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V
C375	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C376	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C501	1-130-495-00	MYLAR 0.1MF	5%	50V
C502	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C503	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C504	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C505	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C506	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C507	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description			Remark
C508	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C509	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C510	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C511	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C512	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C513	1-124-779-00	ELECT CHIP	10MF	20%	16V
C514	1-135-180-21	TANTAL. CHIP	3.3MF	20%	6.3V
C515	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V
C516	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C518	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C519	1-162-969-11	CERAMIC CHIP	0.0068MF	10%	25V
C520	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C521	1-162-638-11	CERAMIC CHIP	1MF		16V
C522	1-124-779-00	ELECT CHIP	10MF	20%	16V
C523	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C524	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C525	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C526	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C530	1-164-107-11	CERAMIC CHIP	0.15MF	10%	16V
C531	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C532	1-164-107-11	CERAMIC CHIP	0.15MF	10%	16V
C542	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C543	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C544	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C546	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C547	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C548	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C549	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C550	1-162-638-11	CERAMIC CHIP	1MF		16V
C551	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C552	1-164-227-11	CERAMIC CHIP	0.022MF	10%	25V
C553	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C554	1-164-227-11	CERAMIC CHIP	0.022MF	10%	25V
C555	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C556	1-162-638-11	CERAMIC CHIP	1MF		16V
C557	1-162-638-11	CERAMIC CHIP	1MF		16V
C558	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C559	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C560	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C561	1-162-638-11	CERAMIC CHIP	1MF		16V
C562	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C563	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C564	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C565	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V
C566	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C567	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C571	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C572	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C573	1-164-634-11	CERAMIC CHIP	1MF		16V
C574	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C601	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C602	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C603	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V

Ref.No.	Part No.	Description			Remark
C604	1-135-177-21	TANTAL. CHIP	1MF	20%	20V
C606	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C607	1-124-443-00	ELECT	100MF	20%	10V
C608	1-135-180-21	TANTAL. CHIP	3.3MF	20%	6.3V
C609	1-162-638-11	CERAMIC CHIP	1MF		16V
C610	1-162-638-11	CERAMIC CHIP	1MF		16V
C611	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C612	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C613	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C614	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C615	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C616	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C618	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C620	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C622	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C623	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C624	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C661	1-162-966-11	CERAMIC CHIP	0.0022MF		50V
C662	1-163-023-00	CERAMIC CHIP	0.015MF		50V
C663	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C664	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C665	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C667	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C668	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C681	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C682	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C683	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C690	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C691	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V

CONNECTOR

Ref.No.	Part No.	Description
CN101	1-566-531-11	CONNECTOR, FPC (ZIF) 15P
CN201	1-566-542-31	CONNECTOR, FPC (NON ZIF) 10P
CN202	1-568-342-41	CONNECTOR, BOARD TO BOARD 7P
CN203	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P
CN204	1-568-364-41	CONNECTOR, BOARD TO BOARD 12P
CN205	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P
CN206	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P
CN501	1-566-541-11	CONNECTOR, FPC (NON ZIF) 9P
CN502	1-565-662-11	CONNECTOR (PC BOARD) 15P
CN601	1-566-538-11	CONNECTOR, FPC (NON ZIF) 6P
CN602	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P
CN603	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P
CN604	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P
CN605	1-568-329-11	CONNECTOR, BOARD TO BOARD 17P
CN607	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P

DIODE

Ref.No.	Part No.	Description
D201	8-719-404-46	DIODE MA110
D211	8-719-118-21	DIODE 1SS283

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
D213	8-719-404-35	DIODE MA141WK	
D214	8-719-404-35	DIODE MA141WK	
D215	8-719-800-76	DIODE 1SS226	
D216	8-719-404-46	DIODE MA110	
D217	8-719-404-46	DIODE MA110	
D218	8-719-404-46	DIODE MA110	
D601	8-719-404-40	DIODE MA121	
D602	8-719-404-40	DIODE MA121	
D603	8-719-404-40	DIODE MA121	
D604	8-719-404-40	DIODE MA121	
D605	8-719-404-46	DIODE MA110	
D606	8-719-404-46	DIODE MA110	
D681	8-719-404-46	DIODE MA110	

FILTER

Ref.No.	Part No.	Description	Remark
FL201	1-236-186-11	FILTER, BAND PASS	
FL202	1-409-446-11	FILTER, TRAP	
FL203	1-577-162-11	FILTER, CERAMIC	
FL204	1-409-475-21	FILTER, TRAP	

IC

Ref.No.	Part No.	Description	Remark
IC101	8-752-033-38	IC CXA1202R	
IC102	8-752-033-38	IC CXA1202R	
IC201	8-752-033-40	IC CXA1201Q	
IC202	8-752-324-87	IC CXL1502M	
IC203	8-752-034-40	IC CXA1200BQ	
IC204	8-759-605-61	IC CXA1203N	
IC205	8-759-009-22	IC MC14094BF	
IC501	8-759-506-96	IC CXA8006M-Q	
IC502	8-759-150-12	IC CXA8010N	
IC504	8-752-038-71	IC CXA1127AM	
IC505	8-752-035-48	IC CXA1204Q	
IC601	8-752-816-62	IC CXP80116-690Q	
IC602	8-759-990-78	IC S-81350AG-REG	
IC603	8-759-987-66	IC TL7757CPK	
IC604	8-759-150-05	IC UPC324G2	
IC605	8-759-030-64	IC MPC1710AM	
IC607	8-759-100-93	IC UPC393G2	

COIL

Ref.No.	Part No.	Description	Remark
L101	1-412-033-11	INDUCTOR CHIP 220UH	
L102	1-410-385-11	INDUCTOR CHIP 22UH	
L103	1-412-033-11	INDUCTOR CHIP 220UH	
L104	1-410-385-11	INDUCTOR CHIP 22UH	
L161	1-412-029-11	INDUCTOR CHIP 10UH	
L162	1-412-029-11	INDUCTOR CHIP 10UH	
L191	1-412-033-11	INDUCTOR CHIP 220UH	
L192	1-410-381-11	INDUCTOR CHIP 10UH	
L201	1-410-393-11	INDUCTOR CHIP 100UH	
L202	1-410-393-11	INDUCTOR CHIP 100UH	
L203	1-412-031-11	INDUCTOR CHIP 47UH	
L204	1-412-031-11	INDUCTOR CHIP 47UH	
L205	1-410-388-21	INDUCTOR CHIP 39UH	
L206	1-410-384-31	INDUCTOR CHIP 18UH	
L208	1-410-387-11	INDUCTOR CHIP 33UH	
L209	1-410-390-11	INDUCTOR CHIP 56UH	
L210	1-412-029-11	INDUCTOR CHIP 10UH	
L211	1-410-389-31	INDUCTOR CHIP 47UH	
L212	1-410-393-11	INDUCTOR CHIP 100UH	
L213	1-410-377-31	INDUCTOR CHIP 4.7UH	
L214	1-408-797-11	INDUCTOR CHIP 470UH	
L216	1-410-388-21	INDUCTOR CHIP 39UH	
L217	1-408-795-21	INDUCTOR CHIP 330UH	
L218	1-410-393-11	INDUCTOR CHIP 100UH	
L219	1-410-380-31	INDUCTOR CHIP 8.2UH	
L220	1-408-795-21	INDUCTOR CHIP 330UH	
L221	1-410-655-31	INDUCTOR CHIP 120UH	
L222	1-410-393-11	INDUCTOR CHIP 100UH	
L223	1-410-656-11	INDUCTOR CHIP 150UH	
L224	1-410-657-21	INDUCTOR CHIP 180UH	
L225	1-410-387-11	INDUCTOR CHIP 33UH	
L226	1-410-657-21	INDUCTOR CHIP 180UH	
L227	1-410-381-11	INDUCTOR CHIP 10UH	
L228	1-412-029-11	INDUCTOR CHIP 10UH	
L229	1-410-393-11	INDUCTOR CHIP 100UH	
L230	1-410-393-11	INDUCTOR CHIP 100UH	
L231	1-410-658-31	INDUCTOR CHIP 220UH	
L502	1-408-795-21	INDUCTOR CHIP 330UH	
L503	1-412-032-11	INDUCTOR CHIP 100UH	
L504	1-412-032-11	INDUCTOR CHIP 100UH	
L601	1-412-031-11	INDUCTOR CHIP 47UH	
L602	1-412-031-11	INDUCTOR CHIP 47UH	

IC LINK

Ref.No.	Part No.	Description	Remark
PS601⚠	1-532-605-00	LINK, IC ICP-N10 0.4A	
PS602⚠	1-532-685-00	LINK, IC ICP-N20 0.8A	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q101	8-729-209-07	TRANSISTOR 2SC4213B	
Q102	8-729-209-07	TRANSISTOR 2SC4213B	
Q103	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q104	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q105	8-729-209-07	TRANSISTOR 2SC4213B	
Q106	8-729-209-07	TRANSISTOR 2SC4213B	
Q107	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q108	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q109	8-729-402-42	TRANSISTOR UN5213	
Q161	8-729-403-35	TRANSISTOR UN5113	
Q162	8-729-117-32	TRANSISTOR 2SC4177	
Q164	8-729-402-42	TRANSISTOR UN5213	
Q165	8-729-402-42	TRANSISTOR UN5213	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark
Q166	8-729-402-42	TRANSISTOR UN5213	
Q167	8-729-402-42	TRANSISTOR UN5213	
Q191	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q193	8-729-216-22	TRANSISTOR 2SA1162	
Q201	8-729-101-07	TRANSISTOR 2SB798-DL	
Q202	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q203	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q205	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q206	8-729-907-00	TRANSISTOR DTC114EU	
Q207	8-729-140-88	TRANSISTOR FP1A3M	
Q208	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q209	8-729-402-42	TRANSISTOR UN5213	
Q211	8-729-905-61	TRANSISTOR DTC124EU	
Q212	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q213	8-729-117-32	TRANSISTOR 2SC4177	
Q214	8-729-117-32	TRANSISTOR 2SC4177	
Q215	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q216	8-729-117-32	TRANSISTOR 2SC4177	
Q217	8-729-102-07	TRANSISTOR 2SC2223F-13	
Q218	8-729-117-32	TRANSISTOR 2SC4177	
Q219	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q220	8-729-117-32	TRANSISTOR 2SC4177	
Q222	8-729-117-32	TRANSISTOR 2SC4177	
Q223	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q224	8-729-403-35	TRANSISTOR UN5113	
Q225	8-729-117-32	TRANSISTOR 2SC4177	
Q226	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q227	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q228	8-729-117-32	TRANSISTOR 2SC4177	
Q229	8-729-905-15	TRANSISTOR DTC144WU	
Q230	8-729-117-32	TRANSISTOR 2SC4177	
Q231	8-729-905-15	TRANSISTOR DTC144WU	
Q232	8-729-140-88	TRANSISTOR FP1A3M	
Q233	8-729-117-32	TRANSISTOR 2SC4177	
Q234	8-729-117-32	TRANSISTOR 2SC4177	
Q235	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q236	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q237	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q238	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q239	8-729-117-32	TRANSISTOR 2SC4177	
Q241	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q242	8-729-402-42	TRANSISTOR UN5213	
Q243	8-729-403-35	TRANSISTOR UN5113	
Q244	8-729-420-12	TRANSISTOR XN4213	
Q245	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q246	8-729-117-32	TRANSISTOR 2SC4177	
Q247	8-729-117-32	TRANSISTOR 2SC4177	
Q248	8-729-403-35	TRANSISTOR UN5113	
Q249	8-729-420-12	TRANSISTOR XN4213	
Q250	8-729-403-35	TRANSISTOR UN5113	
Q251	8-729-402-42	TRANSISTOR UN5213	
Q252	8-729-117-32	TRANSISTOR 2SC4177	
Q253	8-729-117-32	TRANSISTOR 2SC4177	
Q254	8-729-403-35	TRANSISTOR UN5113	
Q255	8-729-921-08	TRANSISTOR DTC144TU	
Q256	8-729-402-42	TRANSISTOR UN5213	
Q258	8-729-921-08	TRANSISTOR DTC144TU	
Q259	8-729-921-58	TRANSISTOR DTA144TU	
Q260	8-729-117-32	TRANSISTOR 2SC4177	
Q261	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q270	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q272	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q275	8-729-402-42	TRANSISTOR UN5213	
Q276	8-729-403-35	TRANSISTOR UN5113	
Q501	8-729-403-27	TRANSISTOR XN4401	
Q502	8-729-822-94	TRANSISTOR FC102	
Q503	8-729-822-94	TRANSISTOR FC102	
Q541	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q542	8-729-117-32	TRANSISTOR 2SC4177	
Q543	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q571	8-729-403-27	TRANSISTOR XN4401	
Q572	8-729-403-27	TRANSISTOR XN4401	
Q573	8-729-117-32	TRANSISTOR 2SC4177	
Q601	8-729-403-24	TRANSISTOR XN4210	
Q602	8-729-403-24	TRANSISTOR XN4210	
Q603	8-729-403-24	TRANSISTOR XN4210	
Q604	8-729-403-24	TRANSISTOR XN4210	
Q606	8-729-403-24	TRANSISTOR XN4210	
Q607	8-729-403-24	TRANSISTOR XN4210	
Q608	8-729-403-24	TRANSISTOR XN4210	
Q609	8-729-403-24	TRANSISTOR XN4210	
Q610	8-729-403-24	TRANSISTOR XN4210	
Q611	8-729-420-12	TRANSISTOR XN4213	
Q612	8-729-403-35	TRANSISTOR UN5113	
Q613	8-729-402-42	TRANSISTOR UN5213	
Q614	8-729-903-97	TRANSISTOR FMS1FE	
Q615	8-729-903-82	TRANSISTOR FMW2	
Q616	8-729-117-32	TRANSISTOR 2SC4177	
Q617	8-729-903-97	TRANSISTOR FMS1FE	
Q618	8-729-903-97	TRANSISTOR FMS1FE	
Q619	8-729-907-00	TRANSISTOR DTC114EU	
Q620	8-729-421-90	TRANSISTOR XN4113	
Q621	8-729-420-12	TRANSISTOR XN4213	
Q622	8-729-422-14	TRANSISTOR XN4111	
Q623	8-729-117-32	TRANSISTOR 2SC4177	
Q624	8-729-422-14	TRANSISTOR XN4111	
Q643	8-729-403-24	TRANSISTOR XN4210	
Q644	8-729-403-35	TRANSISTOR UN5113	
Q645	8-729-402-42	TRANSISTOR UN5213	
Q661	8-729-117-32	TRANSISTOR 2SC4177	
Q662	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q663	8-729-117-32	TRANSISTOR 2SC4177	
Q664	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q665	8-729-117-32	TRANSISTOR 2SC4177	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description				Remark
Q681	8-729-117-32	TRANSISTOR 2SC4177				
Q682	8-729-820-42	TRANSISTOR 2SB1202FAS				
Q683	8-729-902-93	TRANSISTOR FMG4				
Q684	8-729-903-97	TRANSISTOR FMS1FE				
		RESISTOR				
R101	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R102	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R103	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R104	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R105	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R106	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R107	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R108	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R109	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R110	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R111	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R112	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R113	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R114	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R115	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R116	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R117	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R118	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R119	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R120	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R121	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R123	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R124	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R125	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R126	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R127	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R128	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R129	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R130	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R131	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R132	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R134	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R135	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R139	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R140	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R141	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R142	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R143	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R144	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R161	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R162	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R163	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R164	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R165	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R166	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R167	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R168	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R170	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R171	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R172	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R173	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R174	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R175	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R176	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R177	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R178	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R179	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R191	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R192	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R193	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R194	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R197	1-216-801-11	METAL GLAZE	22	5%	1/16W	
R198	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R201	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R202	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R203	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R204	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R205	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R206	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R207	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R208	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R209	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R210	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R211	1-216-022-00	METAL GLAZE	75	5%	1/10W	
R214	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R215	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R216	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R217	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R218	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R219	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R220	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R221	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R222	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R223	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R224	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R225	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R226	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R227	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R228	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R229	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R230	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R231	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R232	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R233	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R234	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R235	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R236	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R237	1-216-821-11	METAL GLAZE	1K	5%	1/16W	

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark
R238	1-216-814-11	METAL GLAZE 270 5% 1/16W	
R239	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R240	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R241	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R243	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R244	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R245	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R246	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R247	1-216-807-11	METAL GLAZE 68 5% 1/16W	
R249	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R250	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R251	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R252	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R253	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R254	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R255	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R256	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R257	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R258	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R259	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R260	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R261	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R262	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R263	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R264	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R265	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R266	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R267	1-216-826-11	METAL GLAZE 2.7K 5% 1/16W	
R268	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R269	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R270	1-216-643-11	METAL CHIP 470 0.50% 1/10W	
R271	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R272	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R273	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R274	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R275	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R276	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R277	1-216-810-11	METAL GLAZE 120 5% 1/16W	
R278	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R279	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R280	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R281	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R282	1-216-826-11	METAL GLAZE 2.7K 5% 1/16W	
R283	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R284	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R285	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R286	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R287	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R288	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R289	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R290	1-216-843-11	METAL GLAZE 68K 5% 1/16W	
R291	1-216-855-11	METAL GLAZE 680K 5% 1/16W	
R293	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R294	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R295	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R296	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R297	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R298	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R300	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R301	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R302	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R303	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R304	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R305	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R306	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R311	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R313	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R315	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R316	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R317	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R318	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R319	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R320	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R321	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R322	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R325	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R326	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R327	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R328	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R329	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R330	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R331	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R332	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R333	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R334	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R336	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R337	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R338	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R339	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R341	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R342	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R343	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R344	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R345	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R346	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R347	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R348	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R349	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R352	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R354	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R355	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R356	1-216-808-11	METAL GLAZE 82 5% 1/16W	
R357	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R358	1-216-824-11	METAL GLAZE 1.8K 5% 1/16W	
R359	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description				Remark
R360	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R361	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R362	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R363	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R364	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R365	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R366	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R369	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R377	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R378	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R379	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R380	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R381	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R382	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R383	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R384	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R387	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R388	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R389	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R390	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R391	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R392	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R393	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R394	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R396	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R501	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R502	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R503	1-216-870-11	METAL GLAZE	180K	1%	1/10W	
R504	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R505	1-216-653-11	METAL CHIP	1.2K	0.50%	1/10W	
R506	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R507	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R509	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R510	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R511	1-216-816-11	METAL GLAZE	390	5%	1/16W	
R512	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R513	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R514	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R515	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R516	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R517	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R518	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R520	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R521	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R522	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R526	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R527	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R528	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R529	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R530	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R531	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R532	1-216-844-11	METAL GLAZE	82K	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R533	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R534	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R535	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R536	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R537	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R544	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R545	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R548	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R549	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R550	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R551	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R552	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R553	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R554	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R555	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R556	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R557	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R558	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R559	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R560	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R571	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R572	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R573	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R574	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R575	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R576	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R577	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R580	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R590	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R591	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R592	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R593	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R594	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R595	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R597	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R598	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R601	1-216-864-11	METAL GLAZE	0	5%	1/16W	
		(E, Australian)				
R602	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R604	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R605	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R610	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R611	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R612	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R613	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R614	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R615	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R616	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R617	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R618	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R619	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R620	1-216-844-11	METAL GLAZE	82K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
R621	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R622	1-216-844-11	METAL GLAZE 82K 5% 1/16W	
R625	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R626	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R627	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R628	1-216-853-11	METAL GLAZE 470K 5% 1/16W	
R633	1-216-176-00	METAL GLAZE 120 5% 1/8W	
R634	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R635	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R645	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R646	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R647	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R648	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R661	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R662	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R663	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R664	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R665	1-216-810-11	METAL GLAZE 120 5% 1/16W	
R666	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R667	1-216-843-11	METAL GLAZE 68K 5% 1/16W	
R668	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R669	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R670	1-216-824-11	METAL GLAZE 1.8K 5% 1/16W	
R671	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R672	1-216-854-11	METAL GLAZE 560K 5% 1/16W	
R673	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R674	1-216-851-11	METAL GLAZE 330K 5% 1/16W	
R675	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R676	1-216-861-11	METAL GLAZE 2.2M 5% 1/16W	
R678	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R679	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R681	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R682	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R683	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R684	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R685	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R686	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R687	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R688	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R689	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R690	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R691	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R695	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R696	1-217-671-11	METAL GLAZE 1 5% 1/10W	
R697	1-217-671-11	METAL GLAZE 1 5% 1/10W	
R698	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R699	1-216-833-11	METAL GLAZE 10K 5% 1/16W	

NETWORK RESISTOR

Ref.No.	Part No.	Description	Remark
RB101	1-236-420-11	NETWORK, RES 4.7K	
RB102	1-236-420-11	NETWORK, RES 4.7K	
RB107	1-236-420-11	NETWORK, RES 4.7K	
RB108	1-236-420-11	NETWORK, RES 4.7K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB204	1-236-408-11	NETWORK, RES 470	
RB206	1-236-409-11	NETWORK, RES 560	
RB207	1-236-436-11	NETWORK, RES 100K	
RB208	1-236-412-11	NETWORK, RES 1.0K	
RB209	1-236-420-11	NETWORK, RES 4.7K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB541	1-236-408-11	NETWORK, RES 470	
RB542	1-236-418-11	NETWORK, RES 3.3K	
RB543	1-236-418-11	NETWORK, RES 3.3K	
RB601	1-236-436-11	NETWORK, RES 100K	
RB602	1-236-436-11	NETWORK, RES 100K	
RB603	1-236-436-11	NETWORK, RES 100K	
RB604	1-236-436-11	NETWORK, RES 100K	
RB605	1-236-436-11	NETWORK, RES 100K	
RB606	1-236-436-11	NETWORK, RES 100K	
RB607	1-236-436-11	NETWORK, RES 100K	
RB608	1-236-436-11	NETWORK, RES 100K	
RB609	1-236-436-11	NETWORK, RES 100K	
RB610	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB612	1-236-424-11	NETWORK, RES 10K	
RB614	1-236-424-11	NETWORK, RES 10K	
RB615	1-236-436-11	NETWORK, RES 100K	
RB616	1-236-424-11	NETWORK, RES 10K	
RB617	1-236-431-11	NETWORK, RES 39K	
RB618	1-236-432-11	NETWORK, RES 47K	
RB619	1-236-424-11	NETWORK, RES 10K	
RB620	1-236-408-11	NETWORK, RES 470	
RB621	1-236-408-11	NETWORK, RES 470	
RB661	1-236-424-11	NETWORK, RES 10K	
RB662	1-236-442-11	NETWORK, RES 330K	
RB682	1-236-424-11	NETWORK, RES 10K	

VARIABLE RESISTOR

Ref.No.	Part No.	Description	Remark
RV101	1-238-089-11	RES, ADJ CERMET 4.7K	
RV102	1-238-089-11	RES, ADJ CERMET 4.7K	
RV103	1-238-089-11	RES, ADJ CERMET 4.7K	
RV104	1-238-089-11	RES, ADJ CERMET 4.7K	
RV111	1-238-092-11	RES, ADJ CERMET 47K	
RV112	1-238-092-11	RES, ADJ CERMET 47K	
RV113	1-238-092-11	RES, ADJ CERMET 47K	
RV114	1-238-092-11	RES, ADJ CERMET 47K	
RV201	1-238-092-11	RES, ADJ CERMET 47K	
RV202	1-238-087-11	RES, ADJ CERMET 1K	
RV203	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV204	1-238-089-11	RES, ADJ CERMET 4.7K	
RV205	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV206	1-238-092-11	RES, ADJ CERMET 47K	
RV207	1-238-090-11	RES, ADJ CERMET 10K	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
RV208	1-238-086-11	RES, ADJ CERMET 470	
RV209	1-238-087-11	RES, ADJ CERMET 1K	
RV210	1-238-086-11	RES, ADJ CERMET 470	
RV212	1-238-089-11	RES, ADJ CERMET 4.7K	
RV213	1-238-090-11	RES, ADJ CERMET 10K	
RV502	1-238-095-11	RES, ADJ CERMET 470K	
RV602	1-238-092-11	RES, ADJ CERMET 47K	

FLEXIBLE BOARD

Ref.No.	Part No.	Description	Remark
W604	1-630-592-11	PC BOARD, FP-184 FLEXIBLE	

CRISTAL

Ref.No.	Part No.	Description	Remark
X201	1-577-117-21	VIBRATOR, CRYSTAL (4.43MHz)	
X501	1-577-362-21	VIBRATOR, CRYSTAL (5.85938MHz)	
X601	1-577-349-21	VIBRATOR, CRYSTAL (16MHz)	

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*A-7062-405-A LD-33 BOARD, COMPLETE (Ref. No. 3,000
********************* series)

CAPACITOR

Ref.No.	Part No.	Description			Remark
C701	1-135-189-11	TANTAL. CHIP 4.7MF	20%	6.3V	
C702	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C703	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V	
C706	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C707	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V	
C708	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C709	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C710	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V	
C711	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V	
C713	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C715	1-164-156-11	CERAMIC CHIP 0.1MF		25V	
C716	1-162-637-11	CERAMIC CHIP 0.47MF		16V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN702	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
CN703	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN704	*1-565-543-21	PIN, CONNECTOR (PC BOARD) 4P	
CN705	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	

DIODE

Ref.No.	Part No.	Description	Remark
D701	8-719-404-46	DIODE MA110	

IC

Ref.No.	Part No.	Description	Remark
IC701	8-759-037-20	IC MPC1737M	
IC702	8-759-100-94	IC UPC358G2	
IC703	8-759-981-82	IC RC3414M	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q701	8-729-905-15	TRANSISTOR DTC144WU	
Q702	8-729-920-39	TRANSISTOR IMT1US	
Q703	8-729-905-61	TRANSISTOR DTC124EU	
Q704	8-729-602-36	TRANSISTOR 2SA1602	
Q706	8-729-805-25	TRANSISTOR 2SB1121	
Q707	8-729-117-32	TRANSISTOR 2SC4177	

RESISTOR

Ref.No.	Part No.	Description				Remark
R701	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R702	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R703	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R705	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R707	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R708	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R709	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R710	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R712	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R713	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R714	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R715	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R716	1-216-309-00	METAL GLAZE	5.6	5%	1/10W	
R717	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R718	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R719	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R720	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R723	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R725	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R726	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R730	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R732	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R733	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R734	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R735	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R736	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R737	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R739	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R740	1-216-843-11	METAL GLAZE	68K	5%	1/16W	

VARIABLE RESISTOR

Ref.No.	Part No.	Description	Remark
RV701	1-238-094-11	RES, ADJ CERMET 220K	

FLEXIBLE BOARD

Ref.No.	Part No.	Description	Remark
W701	1-630-595-21	PC BOARD, FP-187 FLEXIBLE	

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When indicating parts by reference number, please include the board name.

VC-80

Ref.No.	Part No.	Description		Remark
	*A-7062-406-A	VC-80 BOARD, COMPLETE (Ref. No. 2,000 ********************* series)		
	A-7068-175-A	DT-77J BOARD, COMPLETE (HIC)		
	1-635-395-11	PC BOARD, FP-351 FLEXIBLE		
	1-635-396-11	PC BOARD, FP-362		

CAPACITOR

Ref.No.	Part No.	Description		Remark
C101	1-135-211-11	TANTAL. CHIP 6.8MF	20%	6.3V
C102	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C103	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C104	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C105	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C108	1-126-607-11	ELECT CHIP 47MF	20%	4V
C109	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C112	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C131	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C132	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C133	1-164-633-11	CERAMIC CHIP 0.1MF	10%	25V
C134	1-135-079-21	TANTAL. CHIP 3.3MF	20%	35V
C136	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C137	1-135-177-21	TANTAL. CHIP 1MF	20%	20V
C138	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C142	1-164-633-11	CERAMIC CHIP 0.1MF	10%	25V
C143	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C145	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C149	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C151	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C152	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C153	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C154	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C156	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C157	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C158	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C180	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C181	1-135-177-21	TANTAL. CHIP 1MF	20%	20V
C182	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C183	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C184	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C185	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C187	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C188	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C189	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C191	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C192	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C199	1-164-155-11	CERAMIC CHIP 75PF	10%	50V
C200	1-164-160-11	CERAMIC CHIP 20PF	10%	50V
C201	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C202	1-162-638-11	CERAMIC CHIP 1MF		16V
C203	1-162-638-11	CERAMIC CHIP 1MF		16V
C204	1-162-638-11	CERAMIC CHIP 1MF		16V
C205	1-162-638-11	CERAMIC CHIP 1MF		16V
C206	1-162-638-11	CERAMIC CHIP 1MF		16V
C210	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C211	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C212	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C213	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C214	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C215	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C216	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C217	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C219	1-162-638-11	CERAMIC CHIP 1MF		16V
C220	1-162-638-11	CERAMIC CHIP 1MF		16V
C221	1-162-638-11	CERAMIC CHIP 1MF		16V
C222	1-162-638-11	CERAMIC CHIP 1MF		16V
C223	1-162-638-11	CERAMIC CHIP 1MF		16V
C224	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C225	1-162-638-11	CERAMIC CHIP 1MF		16V
C229	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C230	1-135-211-11	TANTAL. CHIP 6.8MF	20%	6.3V
C232	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C233	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C235	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C236	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C237	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C238	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C239	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C241	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C242	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C243	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C252	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C254	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C255	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C256	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C261	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C262	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C265	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C266	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C267	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C268	1-162-638-11	CERAMIC CHIP 1MF		16V
C269	1-162-638-11	CERAMIC CHIP 1MF		16V
C272	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C273	1-162-951-11	CERAMIC CHIP 68PF	5%	50V
C274	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C275	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C276	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C277	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C279	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C280	1-135-145-11	TANTAL. CHIP 0.47MF	10%	35V
C281	1-162-951-11	CERAMIC CHIP 68PF	5%	50V

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description		Remark
C282	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C283	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C301	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C304	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C305	1-135-177-21	TANTAL. CHIP 1MF	20%	20V
C306	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C307	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C308	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C309	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C310	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C311	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C313	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C315	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C316	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C317	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C318	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C319	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C320	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C321	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C322	1-162-638-11	CERAMIC CHIP 1MF		16V
C323	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C331	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C332	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C333	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C334	1-162-638-11	CERAMIC CHIP 1MF		16V
C336	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C337	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C342	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C343	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C344	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C346	1-162-922-11	CERAMIC CHIP 39PF	5%	50V
C348	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C349	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C362	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C363	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C364	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C365	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C366	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V
C367	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V
C368	1-135-180-21	TANTAL. CHIP 3.3MF	20%	6.3V
C369	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C370	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C371	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C372	1-135-072-21	TANTAL. CHIP 0.22MF	20%	35V
C373	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C374	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C378	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C379	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C389	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C415	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C416	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C501	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C502	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C503	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C504	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C505	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C506	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C507	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C508	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C509	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C510	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C511	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C512	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C513	1-162-913-11	CERAMIC CHIP 8PF	0.5PF	50V
C515	1-162-920-11	CERAMIC CHIP 27PF	5%	50V
C516	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C517	1-164-337-11	CERAMIC CHIP 2.2MF		16V
C518	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C519	1-162-923-11	CERAMIC CHIP 47PF	5%	50V
C520	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C521	1-163-135-00	CERAMIC CHIP 560PF	5%	50V
C522	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C523	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C524	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C525	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C526	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C528	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C530	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C536	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C537	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C538	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C539	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C540	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C541	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C545	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C561	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C562	1-164-160-11	CERAMIC CHIP 20PF	10%	50V
C563	1-162-638-11	CERAMIC CHIP 1MF		16V
C564	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C565	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C566	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C567	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C569	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C570	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C571	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C572	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C611	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C612	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C613	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C614	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C615	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C616	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C617	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C618	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C619	1-164-156-11	CERAMIC CHIP 0.1MF		25V

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark
C620	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C621	1-162-941-11	CERAMIC CHIP 10PF 0.5PF 50V	
C623	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C624	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C625	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C626	1-162-926-11	CERAMIC CHIP 82PF 5% 50V	
C627	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C628	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C629	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C631	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C633	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C634	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C636	1-164-005-11	CERAMIC CHIP 0.47MF 25V	
C637	1-135-180-21	TANTAL. CHIP 3.3MF 20% 6.3V	
C638	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C643	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C644	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C647	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C648	1-126-416-11	ELECT 220MF 20% 10V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN302	1-568-333-11	CONNECTOR, BOARD TO BOARD 14P	
CN304	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN802	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P	
CN803	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P	
CN804	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P	
CN805	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P	
CN806	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P	

TRIMMER

Ref.No.	Part No.	Description	Remark
CT141	1-141-331-11	CAP, VAR, TRIMMER (CHIP) (30PF)	
CT142	1-141-331-11	CAP, VAR, TRIMMER (CHIP) (30PF)	

DIODE

Ref.No.	Part No.	Description	Remark
D101	8-719-404-46	DIODE MA110	
D102	8-719-404-46	DIODE MA110	
D131	8-719-404-32	DIODE MA141WA	
D132	8-719-404-46	DIODE MA110	
D141	8-719-949-46	DIODE 1T32	
D142	8-719-949-46	DIODE 1T32	
D301	8-719-404-46	DIODE MA110	
D361	8-719-404-32	DIODE MA141WA	
D362	8-719-404-46	DIODE MA110	
D561	8-719-404-49	DIODE MA111	
D562	⚠8-719-420-51	DIODE MA729	
D563	8-719-404-46	DIODE MA110	
D610	8-719-404-46	DIODE MA110	
D611	8-719-404-32	DIODE MA141WA	

FILTER

Ref.No.	Part No.	Description	Remark
FL181	1-236-368-11	LPF (YH)	
FL182	1-236-545-11	FILTER, LOW PASS (PAL)	
FL184	1-415-634-21	DL (LC)	
FL301	1-236-187-11	FILTER, LOW PASS	
FL302	1-415-638-11	DL, LC	
FL303	1-415-635-21	DL (LC)	
FL501	1-236-589-11	B.P.F	
FL502	1-415-660-11	DL, LC	
FL503	1-236-913-21	FILTER, LOW PASS	
FL504	1-236-588-11	B.P.F	
FL610	1-236-209-11	FILTER, LOW PASS	

IC

Ref.No.	Part No.	Description	Remark
IC141	8-752-335-85	IC CXD2109Q	
IC181	8-752-034-17	IC CXA1338R	
IC182	8-752-329-79	IC CXL1505N	
IC183	8-752-332-69	IC CXL5504M	
IC251	8-752-034-21	IC CXA1339R	
IC252	8-759-946-00	IC MB88341PFV	
IC253	8-752-039-49	IC CXA1393AN	
IC301	8-752-033-34	IC CXA1072R	
IC302	8-759-946-00	IC MB88341PFV	
IC361	8-759-037-60	IC MC68HC05N4-SC406667	
IC362	8-759-937-56	IC S-8054ALB-LM	
IC363	8-759-106-23	IC MC14066BF	
IC364	8-759-150-05	IC UPC324G2-E1	
IC501	8-759-144-23	IC UPC1037GR	
IC502	8-759-144-23	IC UPC1037GR	
IC503	8-752-031-63	IC CXA1047M-T5	
IC561	8-759-151-23	IC UPD7503GF-J51-3B8	
IC610	8-752-334-49	IC CXD1172AM	
IC611	8-759-502-04	IC MB88346PFV	
IC612	8-752-326-18	IC CXD1204R	
IC613	8-759-037-59	IC MC68HC05C4FU-SC411534	
IC614	8-759-937-56	IC S-8054ALB-LM	
IC615	8-759-100-94	IC UPC358G2	
IC616	8-759-030-74	IC SC14S66FE	

COIL

Ref.No.	Part No.	Description	Remark
L101	1-412-031-11	INDUCTOR CHIP 47UH	
L102	1-412-031-11	INDUCTOR CHIP 47UH	
L141	1-410-391-11	INDUCTOR CHIP 68UH	
L142	1-410-381-11	INDUCTOR CHIP 10UH	
L182	1-412-031-11	INDUCTOR CHIP 47UH	
L183	1-410-381-11	INDUCTOR CHIP 10UH	
L251	1-410-381-11	INDUCTOR CHIP 10UH	
L303	1-410-204-31	INDUCTOR CHIP 10UH	
L304	1-410-392-11	INDUCTOR CHIP 82UH	
L361	1-410-381-11	INDUCTOR CHIP 10UH	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
L401	1-410-192-51	INDUCTOR CHIP 1UH	
L402	1-410-192-51	INDUCTOR CHIP 1UH	
L403	1-412-026-11	INDUCTOR CHIP 1UH	
L404	1-410-192-51	INDUCTOR CHIP 1UH	
L501	1-410-381-11	INDUCTOR CHIP 10UH	
L502	1-410-658-31	INDUCTOR CHIP 220UH	
L503	1-410-388-21	INDUCTOR CHIP 39UH	
L509	1-410-381-11	INDUCTOR CHIP 10UH	
L561	1-410-369-11	INDUCTOR CHIP 1UH	
L610	1-410-381-11	INDUCTOR CHIP 10UH	
L611	1-410-389-31	INDUCTOR CHIP 47UH	
L612	1-410-655-31	INDUCTOR CHIP 120UH	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q101	8-729-402-84	TRANSISTOR XN4601	
Q102	8-729-402-84	TRANSISTOR XN4601	
Q106	8-729-602-36	TRANSISTOR 2SA1602	
Q107	8-729-402-84	TRANSISTOR XN4601	
Q111	8-729-402-84	TRANSISTOR XN4601	
Q112	8-729-402-84	TRANSISTOR XN4601	
Q113	8-729-921-58	TRANSISTOR DTA144TU	
Q131	8-729-421-23	TRANSISTOR XN1501	
Q132	8-729-117-32	TRANSISTOR 2SC4177	
Q135	8-729-403-42	TRANSISTOR XN1401	
Q141	8-729-117-32	TRANSISTOR 2SC4177	
Q142	8-729-117-32	TRANSISTOR 2SC4177	
Q181	8-729-117-32	TRANSISTOR 2SC4177	
Q182	8-729-402-78	TRANSISTOR XN6401	
Q183	8-729-602-36	TRANSISTOR 2SA1602	
Q184	8-729-117-32	TRANSISTOR 2SC4177	
Q185	8-729-421-23	TRANSISTOR XN1501	
Q186	8-729-602-36	TRANSISTOR 2SA1602	
Q189	8-729-602-36	TRANSISTOR 2SA1602	
Q190	8-729-117-32	TRANSISTOR 2SC4177	
Q191	8-729-402-78	TRANSISTOR XN6401	
Q192	8-729-402-78	TRANSISTOR XN6401	
Q193	8-729-402-78	TRANSISTOR XN6401	
Q194	8-729-602-36	TRANSISTOR 2SA1602	
Q195	8-729-602-36	TRANSISTOR 2SA1602	
Q196	8-729-117-32	TRANSISTOR 2SC4177	
Q255	8-729-402-84	TRANSISTOR XN4601	
Q256	8-729-905-18	TRANSISTOR DTC144EU	
Q257	8-729-402-84	TRANSISTOR XN4601	
Q302	8-729-602-36	TRANSISTOR 2SA1602	
Q303	8-729-602-36	TRANSISTOR 2SA1602	
Q305	8-729-117-32	TRANSISTOR 2SC4177	
Q307	8-729-402-81	TRANSISTOR XN4501	
Q310	8-729-117-32	TRANSISTOR 2SC4177	
Q311	8-729-117-32	TRANSISTOR 2SC4177	
Q312	8-729-117-32	TRANSISTOR 2SC4177	
Q313	8-729-403-42	TRANSISTOR XN1401	
Q314	8-729-402-84	TRANSISTOR XN4601	
Q315	8-729-602-36	TRANSISTOR 2SA1602	
Q316	8-729-117-32	TRANSISTOR 2SC4177	
Q317	8-729-117-32	TRANSISTOR 2SC4177	
Q318	8-729-117-32	TRANSISTOR 2SC4177	
Q361	8-729-403-07	TRANSISTOR XN1213	
Q362	8-729-403-10	TRANSISTOR XN6215	
Q363	8-729-117-32	TRANSISTOR 2SC4177	
Q364	8-729-403-10	TRANSISTOR XN6215	
Q365	8-729-402-78	TRANSISTOR XN6401	
Q367	8-729-117-32	TRANSISTOR 2SC4177	
Q368	8-729-403-10	TRANSISTOR XN6215	
Q501	8-729-117-32	TRANSISTOR 2SC4177	
Q502	8-729-117-32	TRANSISTOR 2SC4177	
Q503	8-729-602-36	TRANSISTOR 2SA1602	
Q504	8-729-117-32	TRANSISTOR 2SC4177	
Q505	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q508	8-729-117-32	TRANSISTOR 2SC4177	
Q509	8-729-602-36	TRANSISTOR 2SA1602	
Q561	8-729-602-36	TRANSISTOR 2SA1602	
Q562	8-729-403-24	TRANSISTOR XN4210	
Q563	8-729-905-18	TRANSISTOR DTC144EU	
Q564	8-729-921-08	TRANSISTOR DTC144TU	
Q565	8-729-402-78	TRANSISTOR XN6401	
Q566	8-729-402-19	TRANSISTOR XN6501	
Q567	8-729-402-78	TRANSISTOR XN6401	
Q568	⚠8-729-109-44	TRANSISTOR 2SK94	
Q569	8-729-602-36	TRANSISTOR 2SA1602	
Q570	8-729-905-15	TRANSISTOR DTC144WU	
Q571	8-729-920-39	TRANSISTOR IMT1US	
Q572	8-729-805-25	TRANSISTOR 2SB1121	
Q573	8-729-905-18	TRANSISTOR DTC144EU	
Q610	8-729-403-10	TRANSISTOR XN6215	
Q612	8-729-921-08	TRANSISTOR DTC144TU	
Q613	8-729-117-32	TRANSISTOR 2SC4177	
Q614	8-729-117-32	TRANSISTOR 2SC4177	
Q619	8-729-117-32	TRANSISTOR 2SC4177	
Q620	8-729-117-32	TRANSISTOR 2SC4177	
Q621	8-729-402-19	TRANSISTOR XN6501	

RESISTOR

Ref.No.	Part No.	Description	Remark
R102	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R103	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R104	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R105	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R107	1-216-820-11	METAL GLAZE 820 5% 1/16W	
R108	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R109	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R111	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R112	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R116	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R117	1-216-845-11	METAL GLAZE 100K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

VC-80

Ref.No.	Part No.	Description				Remark
R118	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R123	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R128	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R129	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R132	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R133	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R134	1-216-850-11	METAL GLAZE	270K	5%	1/16W	
R135	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R136	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R137	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R138	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R141	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R142	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R143	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R144	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R147	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R148	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R149	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R150	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R151	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R152	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R153	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R154	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R155	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R156	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R157	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R158	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R162	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R163	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R165	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R166	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R168	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R170	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R171	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R172	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R173	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R174	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R175	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R177	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R178	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R179	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R181	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R182	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R183	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R184	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R185	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R186	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R187	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R189	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R190	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R193	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R194	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R195	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R196	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R197	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R199	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R200	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R204	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R205	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R206	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R207	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R208	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R209	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R210	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R211	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R212	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R213	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R214	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R215	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R217	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R218	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R219	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R220	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R221	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R222	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R223	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R224	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R225	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R226	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R229	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R231	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R233	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R234	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R235	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R236	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R237	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R238	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R239	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R240	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R241	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R242	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R243	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R244	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R245	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R246	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R267	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R268	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R269	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R270	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R272	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R273	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R274	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R275	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R276	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R277	1-216-834-11	METAL GLAZE	12K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description				Remark
R278	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R286	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R287	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R288	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R289	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R290	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R291	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R292	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R293	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R294	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R301	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R302	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R303	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R304	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R305	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R307	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R310	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R311	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R312	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R313	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R314	1-216-816-11	METAL GLAZE	390	5%	1/16W	
R315	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R316	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R318	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R319	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R320	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R321	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R322	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R323	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R331	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R332	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R337	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R338	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R339	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R340	1-216-296-00	METAL GLAZE	0	5%	1/8W	
R341	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R342	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R347	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R348	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R349	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R350	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R351	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R352	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R353	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R355	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R356	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R357	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R358	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R359	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R361	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R362	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R364	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R365	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R366	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R367	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R368	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R369	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R370	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R371	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R372	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R373	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R374	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R375	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R376	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R377	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R378	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R382	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R383	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R384	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R385	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R386	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R388	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R391	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R392	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R394	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R395	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R397	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R398	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R401	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R402	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R403	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R404	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R405	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R406	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R407	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R408	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R409	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R410	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R412	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R413	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R414	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R415	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R417	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R418	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R422	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R424	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R425	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R426	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R427	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R428	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R429	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R430	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R441	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R442	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R443	1-216-864-11	METAL GLAZE	0	5%	1/16W	

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description				Remark
R503	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R505	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R506	1-216-829-11	METAL GLAZE	4. 7K	5%	1/16W	
R507	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R508	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R509	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R510	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R511	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R512	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R513	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R514	1-216-823-11	METAL GLAZE	1. 5K	5%	1/16W	
R515	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R516	1-216-824-11	METAL GLAZE	1. 8K	5%	1/16W	
R517	1-216-831-11	METAL GLAZE	6. 8K	5%	1/16W	
R518	1-216-681-11	METAL CHIP	18K	0. 50%	1/10W	
R519	1-216-677-11	METAL CHIP	12K	0. 50%	1/10W	
R520	1-216-681-11	METAL CHIP	18K	0. 50%	1/10W	
R521	1-216-679-11	METAL CHIP	15K	0. 50%	1/10W	
R522	1-216-826-11	METAL GLAZE	2. 7K	5%	1/16W	
R523	1-216-826-11	METAL GLAZE	2. 7K	5%	1/16W	
R524	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R525	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R526	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R527	1-216-824-11	METAL GLAZE	1. 8K	5%	1/16W	
R528	1-216-827-11	METAL GLAZE	3. 3K	5%	1/16W	
R529	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R530	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R531	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R532	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R533	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R534	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R535	1-216-830-11	METAL GLAZE	5. 6K	5%	1/16W	
R541	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R547	1-216-827-11	METAL GLAZE	3. 3K	5%	1/16W	
R548	1-216-829-11	METAL GLAZE	4. 7K	5%	1/16W	
R549	1-216-823-11	METAL GLAZE	1. 5K	5%	1/16W	
R550	1-216-822-11	METAL GLAZE	1. 2K	5%	1/16W	
R551	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R552	1-216-826-11	METAL GLAZE	2. 7K	5%	1/16W	
R560	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R561	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R562	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R563	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R564	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R565	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R566	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R567	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R568	1-216-097-00	METAL GLAZE	100K	1%	1/10W	
R569	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R570	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R571	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R572	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R573	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R574	⚠1-216-809-11	METAL GLAZE	100	5%	1/16W	
R575	1-216-861-11	METAL GLAZE	2. 2M	5%	1/16W	
R576	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R577	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R578	1-216-136-00	METAL GLAZE	2. 7	5%	1/8W	
R579	1-216-828-11	METAL GLAZE	3. 9K	5%	1/16W	
R580	1-216-822-11	METAL GLAZE	1. 2K	5%	1/16W	
R581	1-216-831-11	METAL GLAZE	6. 8K	5%	1/16W	
R582	1-216-825-11	METAL GLAZE	2. 2K	5%	1/16W	
R583	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R584	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R585	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R587	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R589	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R611	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R617	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R618	1-216-829-11	METAL GLAZE	4. 7K	5%	1/16W	
R619	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R620	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R621	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R623	1-216-829-11	METAL GLAZE	4. 7K	5%	1/16W	
R624	1-216-829-11	METAL GLAZE	4. 7K	5%	1/16W	
R631	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R632	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R633	1-216-825-11	METAL GLAZE	2. 2K	5%	1/16W	
R634	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R635	1-216-854-11	METAL GLAZE	560K	5%	1/16W	
R636	1-216-825-11	METAL GLAZE	2. 2K	5%	1/16W	
R637	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R638	1-216-831-11	METAL GLAZE	6. 8K	5%	1/16W	
R639	1-216-830-11	METAL GLAZE	5. 6K	5%	1/16W	
R640	1-216-827-11	METAL GLAZE	3. 3K	5%	1/16W	
R641	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R642	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R643	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R644	1-216-824-11	METAL GLAZE	1. 8K	5%	1/16W	
R645	1-216-830-11	METAL GLAZE	5. 6K	5%	1/16W	
R646	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R647	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R649	1-216-685-11	METAL CHIP	27K	0. 50%	1/10W	
R650	1-216-675-11	METAL CHIP	10K	0. 50%	1/10W	
R651	1-216-675-11	METAL CHIP	10K	0. 50%	1/10W	
R653	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R654	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R656	1-216-828-11	METAL GLAZE	3. 9K	5%	1/16W	
R657	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R659	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R661	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R662	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R663	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R664	1-216-827-11	METAL GLAZE	3. 3K	5%	1/16W	
R665	1-216-830-11	METAL GLAZE	5. 6K	5%	1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
		NETWORK RESISTOR	
RB101	1-236-424-11	NETWORK, RES 10K	
RB141	1-236-416-11	NETWORK, RES 2.2K	
RB182	1-236-416-11	NETWORK, RES 2.2K	
RB183	1-236-420-11	NETWORK, RES 4.7K	
RB184	1-236-420-11	NETWORK, RES 4.7K	
RB252	1-236-412-11	NETWORK, RES 1.0K	
RB253	1-236-412-11	NETWORK, RES 1.0K	
RB301	1-236-412-11	NETWORK, RES 1.0K	
RB362	1-236-436-11	NETWORK, RES 100K	
RB363	1-236-424-11	NETWORK, RES 10K	
RB561	1-236-436-11	NETWORK, RES 100K	
RB562	1-236-436-11	NETWORK, RES 100K	
RB563	1-236-412-11	NETWORK, RES 1.0K	
RB564	1-236-436-11	NETWORK, RES 100K	
RB565	1-236-436-11	NETWORK, RES 100K	
RB566	1-236-436-11	NETWORK, RES 100K	
RB567	1-236-412-11	NETWORK, RES 1.0K	
RB569	1-236-412-11	NETWORK, RES 1.0K	
RB570	1-236-432-11	NETWORK, RES 47K	
RB571	1-236-412-11	NETWORK, RES 1.0K	
RB572	1-236-412-11	NETWORK, RES 1.0K	
RB574	1-236-436-11	NETWORK, RES 100K	
RB575	1-236-436-11	NETWORK, RES 100K	
RB576	1-236-424-11	NETWORK, RES 10K	
RB577	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB613	1-236-436-11	NETWORK, RES 100K	
RB614	1-236-424-11	NETWORK, RES 10K	
		VARIABLE RESISTOR	
RV501	1-238-089-11	RES, ADJ CERMET 4.7K	
RV502	1-238-089-11	RES, ADJ CERMET 4.7K	
RV503	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV504	1-238-087-11	RES, ADJ CERMET 1K	
RV505	1-238-087-11	RES, ADJ CERMET 1K	
RV561	1-238-093-11	RES, ADJ CERMET 100K	
		CONNECTOR	
W303	1-568-326-11	CONNECTOR, BOARD TO BOARD 7P	
W801	1-568-327-11	CONNECTOR, BOARD TO BOARD 8P	
		CRISTAL	
X101	1-577-119-11	OSCILLATOR, CRYSTAL (28.375MHz)	
X141	1-567-733-11	VIBRATOR, CRYSTAL (17MHz)	
X361	1-577-118-11	VIBRATOR, LITHIUM NIOBATE	
X561	1-579-049-21	VIBRATOR, CRYSTAL (32.768MHz)	

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Ref.No.	Part No.	Description	Remark
	*A-7062-407-A *********************	TI-30 BOARD, COMPLETE	(Ref. No> 4,000 series)
		CAPACITOR	
C801	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C802	1-135-157-21	TANTAL. CHIP 10MF 20%	6.3V
C803	1-162-637-11	CERAMIC CHIP 0.47MF	16V
C804	1-162-913-11	CERAMIC CHIP 8PF 0.5PF	50V
C805	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C807	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C808	1-162-964-11	CERAMIC CHIP 0.001MF 10%	50V
C810	1-135-157-21	TANTAL. CHIP 10MF 20%	6.3V
C811	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C812	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C813	1-162-949-11	CERAMIC CHIP 47PF 5%	50V
C814	1-162-949-11	CERAMIC CHIP 47PF 5%	50V
C815	1-162-949-11	CERAMIC CHIP 47PF 5%	50V
C816	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C817	1-162-975-11	CERAMIC CHIP 24PF 5%	50V
C819	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
		CONNECTOR	
CN801	1-568-368-41	CONNECTOR, BOARD TO BOARD 20P	
		TRIMMER	
CT801	1-141-368-11	CAP, CHIP TRIMMER (30PF)	
CT802	1-141-368-11	CAP, CHIP TRIMMER (30PF)	
		DIODE	
D801	8-713-300-88	DIODE 1T33C	
		IC	
IC801	8-759-979-96	IC MB8464A-15LLPF	
IC802	8-759-150-75	IC UPD6145G-621	
IC803	8-759-971-81	IC MB670479U	
		COIL	
L801	1-410-377-31	INDUCTOR CHIP 4.7UH	
L802	1-410-384-31	INDUCTOR CHIP 18UH	
L803	1-410-390-11	INDUCTOR CHIP 56UH	
L804	1-410-381-11	INDUCTOR CHIP 10UH	
L805	1-410-204-31	INDUCTOR CHIP 10UH	
		TRANSISTOR	
Q801	8-729-905-18	TRANSISTOR DTC144EU	
Q802	8-729-403-24	TRANSISTOR XN4210	

When indicating parts by reference number, please include the board name.

TI-30 VF-40

RESISTOR

Ref.No.	Part No.	Description	Remark
R801	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R805	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R806	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R809	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R810	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R812	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R815	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R816	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R818	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R819	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R820	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R821	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R822	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R823	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R826	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R827	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R828	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R829	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R830	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R831	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R832	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R833	1-216-864-11	METAL GLAZE 0 5% 1/16W	

NETWORK RESISTOR

Ref.No.	Part No.	Description	Remark
RB801	1-236-424-11	NETWORK, RES 10K	
RB802	1-236-424-11	NETWORK, RES 10K	
RB804	1-236-424-11	NETWORK, RES 10K	

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*A-7062-408-A VF-40 BOARD, COMPLETE (Ref. No. 9,000
********************** series)

*3-747-126-01 HOLDER, LED

CAPACITOR

Ref.No.	Part No.	Description	Remark
C951	1-124-442-00	ELECT 330MF 20% 6.3V	
C953	1-163-077-00	CERAMIC CHIP 0.1MF 50V	
C954	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C955	1-163-037-11	CERAMIC CHIP 0.022MF 10% 25V	
C956	1-131-381-00	TANTALUM 47MF 10% 6.3V	
C957	1-163-081-00	CERAMIC CHIP 0.22MF 25V	
C958	1-136-718-11	FILM CHIP 0.1MF 5% 25V	
C959	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C960	1-124-587-11	ELECT 220MF 20% 6.3V	
C961	⚠1-163-205-00	CERAMIC CHIP 0.001MF 10% 50V	
C962	⚠1-163-209-00	CERAMIC CHIP 0.0015MF 5% 50V	
C963	⚠1-163-211-00	CERAMIC CHIP 0.0018MF 5% 50V	
C965	1-126-090-11	ELECT 82MF 20% 10V	
C966	1-124-257-00	ELECT 2.2MF 20% 35V	
C968	1-163-037-11	CERAMIC CHIP 0.022MF 10% 25V	
C969	1-164-611-11	CERAMIC CHIP 0.001MF 10% 500V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN951	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P	
CN952	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN953	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P	

DIODE

Ref.No.	Part No.	Description	Remark
D951	8-719-820-65	DIODE TLS221	
D952	8-719-800-60	DIODE TLR214	
D953	8-719-400-20	DIODE MA152WA	

IC

Ref.No.	Part No.	Description	Remark
IC951	8-759-420-01	IC AN2512S	

COIL

Ref.No.	Part No.	Description	Remark
L951	1-410-831-21	INDUCTOR 82UH	
L952	1-408-785-21	INDUCTOR CHIP 47UH	
L953	⚠1-459-858-11	COIL, FERRITE (HLC)	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q953	8-729-216-22	TRANSISTOR 2SA1162	
Q954	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q955	8-729-106-68	TRANSISTOR 2SD1615A-GP	

RESISTOR

Ref.No.	Part No.	Description	Remark
R953	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R955	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R956	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R957	1-216-031-00	METAL GLAZE 180 5% 1/10W	
R958	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R959	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R960	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R961	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R962	1-216-336-11	METAL GLAZE 47K 1% 1/10W	
R963	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R964	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R965	1-216-308-00	METAL GLAZE 4.7 5% 1/10W	
R967	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R968	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R969	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R970	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R972	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R973	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R974	1-216-131-11	METAL GLAZE 2.7M 5% 1/10W	
R975	1-216-131-11	METAL GLAZE 2.7M 5% 1/10W	
R976	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
R978	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R983	1-216-121-00	METAL GLAZE 1M 5% 1/10W	

VARIABLE RESISTOR

RV951	1-238-092-11	RES, ADJ CERMET 47K	
RV952	1-238-086-11	RES, ADJ CERMET 470	
RV953	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV954	1-228-762-00	RES, ADJ, METAL GLAZE 1M	

TRANSFORMER

T951	⚠1-439-486-11	TRANSFORMER ASSY, FLYBACK	

THERMISTOR

TH951	1-807-938-11	THERMISTOR	

SOCKET

W951	⚠1-540-019-21	SOCKET ASSY, CRT	

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*A-7062-409-A MA-65 BOARD, COMPLETE (Ref. No. 7,000
********************* series)

CAPACITOR

C401	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C402	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C403	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C404	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C405	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	
C406	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C407	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C408	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C409	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C414	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	
C415	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C421	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C422	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C423	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C424	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C425	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	
C426	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C427	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C428	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C429	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C434	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	
C441	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C442	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C443	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C444	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	

Ref.No.	Part No.	Description	Remark
C445	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C451	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C452	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C453	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C454	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C455	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	
C462	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C463	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C464	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C465	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C466	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C467	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C468	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C469	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C470	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	

CONNECTOR

CN401	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN402	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN403	1-566-760-11	PIN, CONNECTOR (PC BOARD) 5P	

DIODE

D401	8-719-404-46	DIODE MA110	

JACK

J401	1-569-810-11	JACK (SMALL TYPE) (MIC PLUG IN POWER)	

COIL

L401	1-410-993-11	INDUCTOR CHIP 1UH	
L402	1-410-993-11	INDUCTOR CHIP 1UH	
L403	1-410-993-11	INDUCTOR CHIP 1UH	

TRANSISTOR

Q401	8-729-905-35	TRANSISTOR 2SC4081R	
Q402	8-729-822-48	TRANSISTOR FC101	
Q403	8-729-822-48	TRANSISTOR FC101	
Q404	8-729-905-35	TRANSISTOR 2SC4081R	
Q405	8-729-821-88	TRANSISTOR 2SK1332-3	
Q421	8-729-905-35	TRANSISTOR 2SC4081R	
Q422	8-729-822-48	TRANSISTOR FC101	
Q423	8-729-822-48	TRANSISTOR FC101	
Q424	8-729-905-35	TRANSISTOR 2SC4081R	
Q425	8-729-821-88	TRANSISTOR 2SK1332-3	
Q441	8-729-822-48	TRANSISTOR FC101	
Q451	8-729-822-48	TRANSISTOR FC101	
Q461	8-729-822-94	TRANSISTOR FC102	
Q462	8-729-822-94	TRANSISTOR FC102	
Q463	8-729-905-12	TRANSISTOR DTA144EU	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

MA-65 CD-43

Ref.No.	Part No.	Description	Remark
Q464	8-729-822-94	TRANSISTOR FC102	
Q465	8-729-822-94	TRANSISTOR FC102	

RESISTOR

Ref.No.	Part No.	Description	Remark
R401	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R402	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R403	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R404	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R405	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R406	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R407	1-216-849-11	METAL GLAZE 220K 5% 1/16W	
R408	1-216-846-11	METAL GLAZE 120K 5% 1/16W	
R409	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R410	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R411	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R412	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R413	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R414	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R415	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R416	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R417	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R418	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R419	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R421	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R422	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R423	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R424	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R425	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R426	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R427	1-216-849-11	METAL GLAZE 220K 5% 1/16W	
R428	1-216-846-11	METAL GLAZE 120K 5% 1/16W	
R429	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R430	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R431	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R432	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R433	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R434	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R435	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R436	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R437	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R438	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R439	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R441	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R442	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R443	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R444	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R445	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R446	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R447	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R451	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R452	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R453	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R454	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R455	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R456	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R457	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R462	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R463	1-216-856-11	METAL GLAZE 820K 5% 1/16W	
R465	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R466	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	

NETWORK RESISTOR

Ref.No.	Part No.	Description	Remark
RB401	1-236-433-11	NETWORK, RES 56K	
RB402	1-236-436-11	NETWORK, RES 100K	
RB403	1-236-420-11	NETWORK, RES 4.7K	
RB404	1-236-427-11	NETWORK, RES 18K	
RB405	1-236-422-11	NETWORK, RES 6.8K	

SWITCH

Ref.No.	Part No.	Description	Remark
S401	1-572-391-11	SWITCH, SLIDE (BUILT-IN MIC HI-FI/WIND)	

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*A-7071-281-A CD-43 BOARD, COMPLETE (Ref. No. 1,000 series)
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CAPACITOR

Ref.No.	Part No.	Description	Remark
C901	1-163-141-00	CERAMIC CHIP 0.001MF 5% 50V	
C903	1-135-159-21	TANTAL CHIP 10MF 20% 20V	
C904	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C905	1-135-177-21	TANTAL. CHIP 1MF 20% 20V	
C907	1-135-162-21	TANTAL. CHIP 33MF 20% 6.3V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN301	1-568-365-41	CONNECTOR, BOARD TO BOARD 14P	

COIL

Ref.No.	Part No.	Description	Remark
L901	1-412-032-11	INDUCTOR CHIP 100UH	

TRANSISTOR

Ref.No.	Part No.	Description	Remark
Q901	8-765-420-02	TRANSISTOR 2SK300-3	

RESISTOR

Ref.No.	Part No.	Description	Remark
R902	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R903	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R904	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R905	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R906	1-216-820-11	METAL GLAZE 820 5% 1/16W	

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When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
	*A-7071-282-A	EL-10 BOARD, COMPLETE (Ref. No. 7,000 series) *********************	

CAPACITOR

Ref.No.	Part No.	Description	Remark
C942	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C943	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C944	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C945	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C947	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C948	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C949	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	

CONNECTOR

Ref.No.	Part No.	Description	Remark
CN941	1-566-760-11	PIN, CONNECTOR (PC BOARD) 5P	
CN942	*1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P	
CN943	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P	

DIODE

Ref.No.	Part No.	Description	Remark
D941	8-719-420-15	DIODE MA8082-M	
D942	8-719-106-71	DIODE RD12M-B2	
D943	8-719-941-86	DIODE DAN202U	
D944	8-719-420-15	DIODE MA8082-M	
D945	8-719-420-15	DIODE MA8082-M	
D946	8-719-420-15	DIODE MA8082-M	
D947	8-719-420-15	DIODE MA8082-M	

JACK

Ref.No.	Part No.	Description	Remark
J902	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J903	1-569-809-11	JACK (SMALL TYPE) (HEADPHONES)	

COIL

Ref.No.	Part No.	Description	Remark
L941	1-410-369-11	INDUCTOR CHIP 1UH	
L942	1-410-369-11	INDUCTOR CHIP 1UH	
L943	1-410-369-11	INDUCTOR CHIP 1UH	
L944	1-410-369-11	INDUCTOR CHIP 1UH	
L945	1-410-369-11	INDUCTOR CHIP 1UH	
L946	1-410-369-11	INDUCTOR CHIP 1UH	

SWITCH

Ref.No.	Part No.	Description	Remark
S941	1-570-724-11	SWITCH, SLIDE (STEREO/AFM.1, 2)	

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MISCELLANEOUS
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Ref.No.	Part No.	Description	Remark
	⚠A-7062-247-A	DD-30 BOARD, COMPLETE (DC-DC CONVERTER UNIT)	
	1-466-361-41	SWITCH BLOCK, CONTROL (CF-1)	
	1-466-362-51	SWITCH BLOCK, CONTROL (FK-1) (E, Australian MODEL)	
	1-466-417-11	SWITCH BLOCK, CONTROL (FK-1) (AEP, UK MODEL)	
	1-537-295-31	TERMINAL BOARD, LITIUM	
	1-537-296-31	TERMINAL BOARD (BATTERY)	
	1-542-126-21	MICROPHONE UNIT	
	1-547-381-12	FILTER BLOCK, OPTICAL	
	1-547-419-11	LENS, ZOOM (VCL-8508XH) (TYPE CAN)	
	1-547-420-11	LENS, ZOOM (VCL-8508XI) (TYPE CHI)	
	1-569-777-11	JACK ASSY, PIN	
	*1-627-721-16	PC BOARD, FP-114 FLEXIBLE	
	1-627-722-11	PC BOARD, FP-149 FLEXIBLE	
	1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL	
	1-944-055-11	HARNESS (CD-26)	
	3-707-998-01	SENSOR ASSY, F (TYPE CAN) (ENCODER)	
	3-708-020-01	SENSOR ASSY, F (YTPE CHI) (ENCODER)	
IC901	8-752-604-72	IC ICX039AN-2	
M901	A-7048-214-A	DRUM BLOCK ASSY (DGH-37A-R) (DRUM)	
M902	8-835-329-01	MOTOR, DC U-21A (CAPSTAN)	
M903	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING)	
M904	3-708-018-01	METER ASSY, IRIS	
M905	3-707-994-01	MOTOR ASSY, AF/Z GEAR (TYPE CAN) (FOCUS/ZOOM)	
M905	3-708-016-01	MOTOR ASSY, AF/Z GEAR (TYPE CHI) (FOCUS/ZOOM)	
PS901	⚠1-532-841-41	LINK, IC PRF1600 1.6A	
PS902	⚠1-532-841-41	LINK, IC PRF1600 1.6A	
PS903	⚠1-532-841-41	LINK, IC PRF1600 1.6A	
V901	⚠1-452-482-31	CRT ASSY (M01JYZ60WB)	

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ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
3-751-908-41	MANUAL, INSTRUCTION (AEP, UK MODEL) (ENGLISH)	
3-751-908-51	MANUAL, INSTRUCTION (AEP MODEL) (FRENCH, GERMAN, SPANISH)	
3-751-908-61	MANUAL, INSTRUCTION (AEP MODEL) (DUTCH, SWEDISH, ITALIAN)	
3-751-908-71	MANUAL, INSTRUCTION (AEP MODEL) (PORTUGUESE)	
3-751-908-81	MANUAL, INSTRUCTION (E MODEL) (CHINESE)	
3-751-909-11	MANUAL, INSTRUCTION (ENGLISH)	
3-751-909-51	MANUAL, INSTRUCTION (AEP, E MODEL) (FRENCH, GERMAN, SPANISH)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
	3-751-909-61	MANUAL, INSTRUCTION (AEP, E MODEL) (DUTCH, SWEDISH, ITALIAN)	
	3-751-909-71	MANUAL, INSTRUCTION (E MODEL) (ARABIC)	
	3-752-419-61	MANUAL, INSTRUCTION (E, Australian MODEL) (ENGLISH)	
	3-752-419-71	MANUAL, INSTRUCTION (E MODEL) (FRENCH, GERMAN, SPANISH)	
	3-752-419-81	MANUAL, INSTRUCTION (E MODEL) (ARABIC)	
	*3-704-281-01	BAG, PROTECTION (STANDARD)	
	3-707-568-01	ADAPTOR, LENS HOOD	
	*3-747-102-01	CUSHION (UPPER)	
	*3-747-103-01	CUSHION (LOWER)	
	*3-764-631-12	INSTRUCTION, DEW CONDENSATION (AEP, E MODEL)	

****ACCESSORIES AND PACKING MATERIALS (KIT)****

Ref.No.	Part No.	Description	Remark
	A-6767-706-A	RFU ADAPTOR (RFU-89EA) (E MODEL)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK MODEL)	
	A-6767-772-A	RFU ADAPTOR (RFU-90AS) (Australian MODEL)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E) (AEP MODEL)	
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (UK, E, Australian MODEL)	
	3-712-673-01	SCREWDRIVER (UK, E, Australian MODEL)	
	3-741-582-01	BELT, SHOULDER	
	*3-747-184-11	INDIVIDUAL CARTON	
	*3-749-211-01	CUSHION (UPPER), ACC	
	*3-749-212-01	CUSHION (LOWER), ACC	
	** AC-V30	AC POWER ADAPTOR	
	*** NP-55	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST
****

SCREW

7-621-281-15	SCREW +P 2X2
7-627-551-87	PRECISION SCREW +P 1.4X1.8

STOP RING

7-624-102-04	STOP RING 1.5, TYPE -E

When indicating parts by reference number, please include the board name.

SECTION 7
CAMERA ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 266.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Adjusting screwdriver
- Regulated power supply (2 units)
- Color monitor
- Vectorscope
- Stop watch
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction	J-6080-058-A	Auto white balance adjustment/confirmation Outdoor white balance adjustment/confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two filters used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, iris in/out adjustment (two used), Max. gain adjustment
	ND filter 0.1	J-6080-807-A	Iris adjustment, iris in/out adjustment, Max. gain adjustment
J-3	Pattern box PTB-450*		
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment
J-6	AF microprocessor data reading jig	J-6082-025-A	
J-7	Adjustment remote commander (RM-95 Modification)	J-6082-053-A	
J-8	Extension cord (16P)	J-6082-062-A	Extension for CF-1 (operation switch) block (during operation)
	Extension cord (14P)	J-6082-061-A	Extension cord for CD-43 board (when repairing VC-80 board)
	Extension cord (20P)	J-6082-063-B	Extension cord for LD-33 board (when repairing VC-80 board)
			Extension cord for TI-30 board (when repairing TI-30 board)
J-9	Extension cord (10P)	J-6082-064-A	Extension cord for JK-63 board (when repairing VS-67 board)

*1 PTB-500 (J-6029-140-A) can also be used.

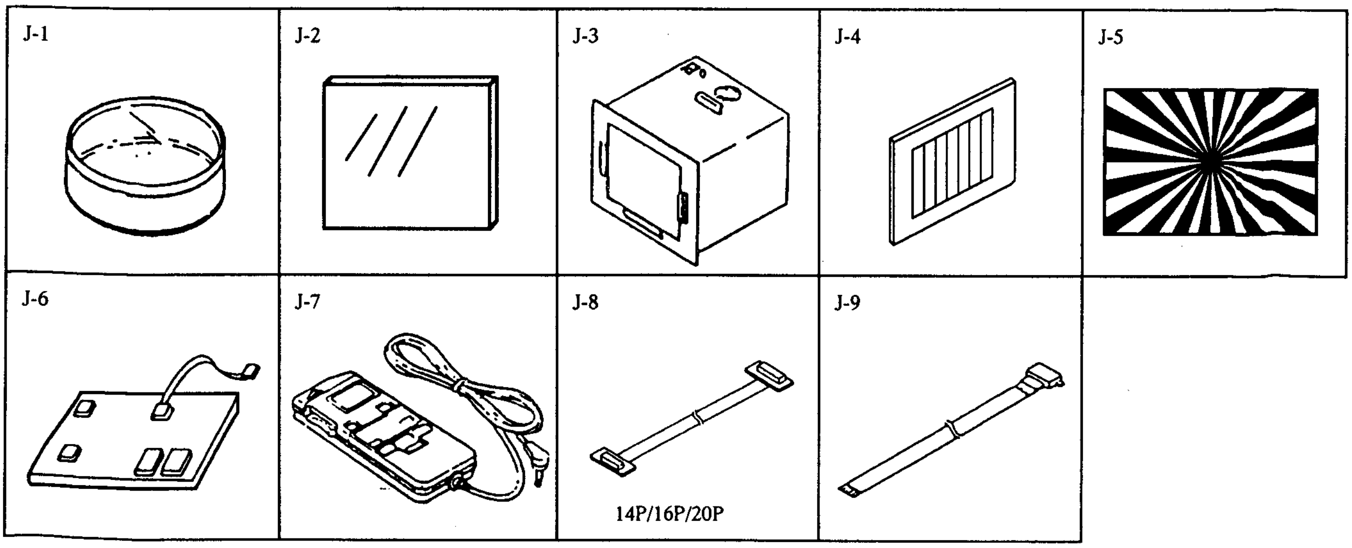


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "2. DISASSEMBLY" for details on removal of the cabinet and various boards.

1) Connect the various devices for adjustment as shown in Fig. 7-3.
2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. Remove CN205 on the VS-67 board when the EVF is not needed.
3) The mic amplifier (MA-65 board) is not needed. Remove CN702 on the AU-85 board.

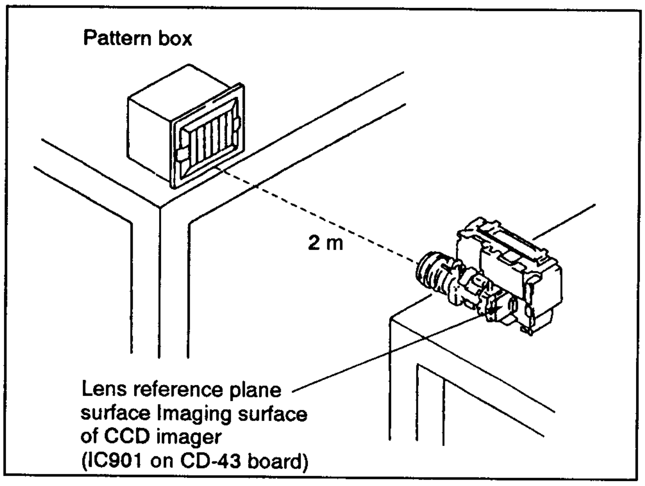
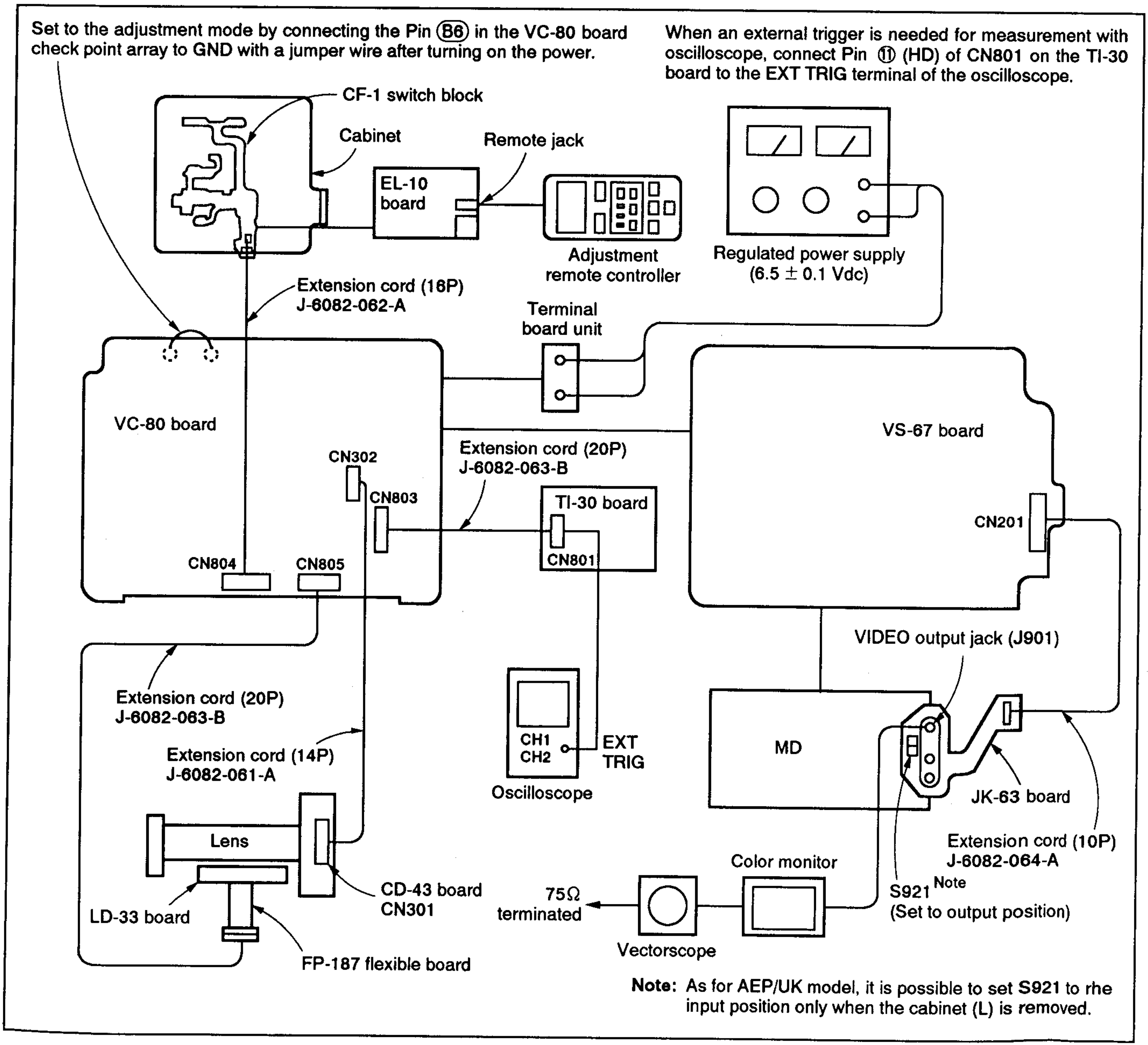

Pattern box
2 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-43 board)

Fig. 7-2.


Set to the adjustment mode by connecting the Pin ⒷⓈ in the VC-80 board check point array to GND with a jumper wire after turning on the power.

When an external trigger is needed for measurement with oscilloscope, connect Pin ⑪ (HD) of CN801 on the TI-30 board to the EXT TRIG terminal of the oscilloscope.

CF-1 switch block
Cabinet
Remote jack
EL-10 board
Adjustment remote controller
Regulated power supply (6.5 ± 0.1 Vdc)
Extension cord (16P) J-6082-062-A
Terminal board unit
VC-80 board
VS-67 board
CN302
CN803
Extension cord (20P) J-6082-063-B
TI-30 board
CN801
CN201
CN804
CN805
VIDEO output jack (J901)
Extension cord (20P) J-6082-063-B
Extension cord (14P) J-6082-061-A
CH1
CH2
EXT TRIG
Oscilloscope
MD
JK-63 board
Lens
Extension cord (10P) J-6082-064-A
Color monitor
CD-43 board CN301
75Ω terminated
S921 Note (Set to output position)
LD-33 board
FP-187 flexible board
Vectorscope

Note: As for AEP/UK model, it is possible to set S921 to rhe input position only when the cabinet (L) is removed.

Fig. 7-3.

7-1-3. Precautions

1. Setting of switches

Unless otherwise specified, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S901 on FK-1 board) ......CAMERA
2. Standby switch (S909 on FK-1 board)......STANDBY
3. Auto-lock switch (S765 on CF-1 board)......OFF
4. White balance button (S757 on CF-1 board) ...... ☼ (indoors white balance mode)
5. Shutter speed button (S760 on CF-1 board) ......NORMAL (1/50)
6. Input/output select switch (S921 on JK-63 board) ......OUTPUT

   Note: As for AEP/UK model, S921 is forcibly fixed to output side by the output cover when the cabinet (L) has been installed.
7. Back-light correction button (S758 on CF-1 board)......OFF

2. Adjustment order

As a rule, the adjustments are performed in the listed order.

3. Subjects

1) Color bar chart (standard picture frame)
   When performing adjustment using the color bar chart, adjust the picture frame shown in Fig. 7-4. (standard picture frame).
2) White pattern (standard picture frame)
   Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is in the same position as the color bar chart (standard picture frame).

Color bar chart standard picture frame

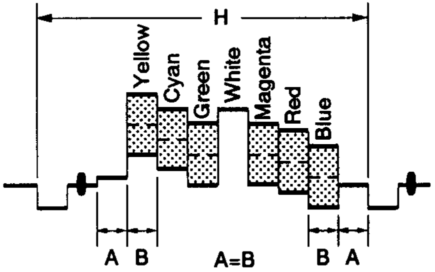


Fig. a (Video input/output terminal output waveform)

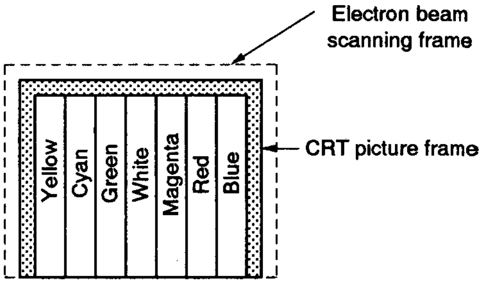


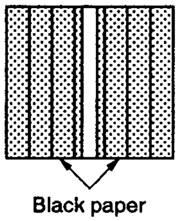
Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) All white pattern
   Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (68 mm) side.
4) High luminance pattern
   Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.
5) Siemens star (J-6080-875-A)
   Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

High luminance pattern



Attach black paper over all sections of the pattern except for half of the white bar of the color bar chartt. Display the picture on the monitor with the standard picture frame.

Fig. 7-5.

High luminance pattern

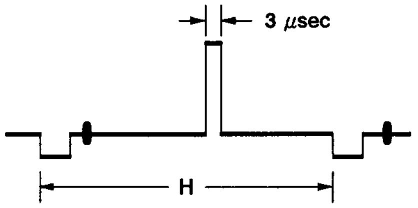


Fig. a (Video input/output terminal output waveform)

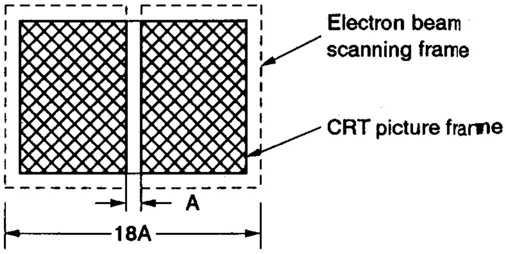


Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-6.

7-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microprocessor (IC361 on VC-80 board). This microprocessor reads the data written in the nonvolatile memory of the microprocessor and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microprocessor using the remote control signal lines (LANC). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microprocessor from the adjustment remote controller. Adjustment addresses and adjustment data are sent from the camera block microprocessor to the adjustment remote controller.

1. Use of adjustment remote controller

Solder the lead wire to Pin (B6) (refer to 7-1-5.) of the check point array on the VC-80 board.

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-10 board). (Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).)
2) Turn on the power of the main unit.
3) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.
(This connection causes the EVR/AWB microprocessor to cease normal remote control operation and to begin adjustment dedicated communications.)
Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote controller if the connection is normal. (Adjustment data varies according to the unit.)

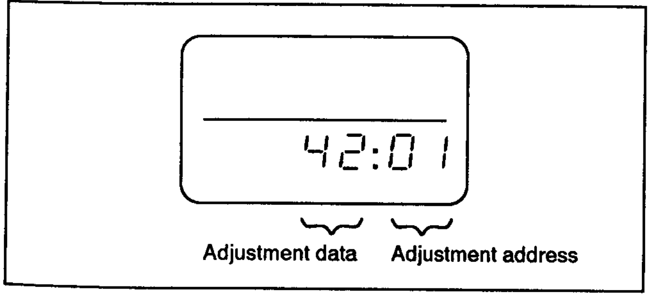


Fig. 7-7.

4) Designate the desired adjustment address using the adjustment remote controller. The adjustment address is incremented by pressing the FF (►►) button and decremented by pressing the REW (◄◄) button. (The adjustment address is indicated in hexadecimal, and there are 117 addresses from 01 to 75. The adjustment address corresponds to the EVR (IC252, IC302, IC611 on VC-80 board) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)
5) Perform adjustment by incrementing or decrementing the adjustment data.
The adjustment data is incremented by pressing the PLAY (►) button. The adjustment data is decremented by pressing the STOP (■) button.
- The adjustment data is indicated in hexadecimal.
There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Indication	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- The adjustment data corresponds to the EVR (IC252, IC302, IC611 on VC-80 board) output voltage, and is as follows.

Adjustment data ( ) is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
F0 (=240)	↑
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
10 (=16)	↓
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

6) The adjustment address is changed using the FF (►►) button or REW (◄◄) button to store the adjustment data in the nonvolatile memory of EVR/AWB microprocessor (IC361 on VC-80 board).
(The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

Note: Data already described in the adjustment data memo column are fixed data.

Adjustment adderss	Adjustment voltage output terminal	Adjustment item	Remarks	Adjustment data memo column
01	Pin ⑱ of IC252	DELTA R	Auto white balance adjustment	
02	Pin ⑲ of IC252	DELTA B		
03	Pin ② of IC252	FADER	Input FF in fader level adjustment	00
04	Pin ③ of IC252	C PED		A0
05	Pin ④ of IC252	R–Y GAIN	Color reproduction adjustment	
06	Pin ⑤ of IC252	B–Y GAIN		
07	Pin ⑥ of IC252	R–Y HUE		
08	Pin ⑦ of IC252	B–Y HUE		
09	Pin ⑧ of IC252	C LEVEL	Chroma level adjustment	
0A	Pin ⑨ of IC252	TITLE Y	Title Y level adjustment	
0B	Pin ⑫ of IC252	R GAIN	Indoor white balance adjustment	
0C	Pin ⑬ of IC252	B GAIN		
0D	Pin ⑱ of IC302	C1 GAIN	Chroma signal matrix adjustment (1)	
0E	Pin ⑲ of IC302	Y1 GAIN	Y signal matrix adjustment	
0F	Pin ② of IC302	FADER LEVEL		
10	Pin ③ of IC302	BURST LEVEL		
11	Pin ④ of IC302	HUE CONT		
12	Pin ⑤ of IC302	SYNC LEVEL		
13	Pin ⑥ of IC302	SET UP		
14	Pin ⑦ of IC302	WHITE CLIP (WC)		
15	Pin ⑧ of IC302	Y LEVEL		
16	Pin ⑨ of IC302	APERTURE		
17	Pin ⑫ of IC302	YH GAIN		
18	Pin ⑬ of IC302	C2 GAIN	Chroma signal matrix adjustment (2)	
19	Pin ⑱ of IC611	IRIS		
1A			Not used	———
1B	Pin ② of IC611	HALL OFFSET	Hall adjustment	
1C	Pin ③ of IC611	MAX GAIN		
1D	Pin ④ of IC611	AGC		
1E	Pin ⑤ of IC611	V SUB		
1F			Not used	———
20	Pin ⑦ of IC611	PG CONT		
21	Pin ⑧ of IC611	TITLE TH	Title A/D level adjustment	
22	Pin ⑨ of IC611	ZOOM L SPD	Power zoom speed fixed data	44
23	Pin ⑫ of IC611	ZOOM H SPD		44
24	Pin ⑬ of IC611	FOCUS SPEED		

Table 7-3. (1)

<table>
<tr><th>Adjustment adderss</th><th>Adjustment voltage output terminal</th><th>Adjustment item</th><th colspan="2">Remarks</th><th>Adjustment data memo column</th></tr>
<tr><td>25</td><td></td><td>MODE</td><td colspan="2">The following adjustment modes are selected by changing the adjustment data.<table><tr><th>Adjustment data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Release</td></tr><tr><td>01</td><td>Focus hunching</td></tr><tr><td>03</td><td>Zoom position</td></tr><tr><td>05</td><td>Hall, iris close</td></tr><tr><td>07</td><td>Hall, iris open</td></tr><tr><td>09</td><td>Hall in/out threshold</td></tr><tr><td>0B</td><td>Auto-focus AGC</td></tr><tr><td>FD</td><td>Auto-focus filter fixed at FA</td></tr><tr><td>FF</td><td>Auto-focus filter fixed at FH</td></tr></table></td><td>00</td></tr>
<tr><td>26</td><td></td><td>FG REF</td><td colspan="2"></td><td>35</td></tr>
<tr><td>27</td><td></td><td>MACRO</td><td colspan="2"></td><td></td></tr>
<tr><td>28</td><td></td><td>IN OUT DOOR</td><td colspan="2"></td><td>1A</td></tr>
<tr><td>29</td><td></td><td>BACK RUSH</td><td colspan="2"></td><td>31</td></tr>
<tr><td>2A</td><td></td><td>BASE-H</td><td colspan="2"></td><td>20</td></tr>
<tr><td>2B</td><td></td><td>LC-THR</td><td colspan="2"></td><td>10</td></tr>
<tr><td>2C</td><td></td><td>SEARCH</td><td colspan="2"></td><td>12</td></tr>
<tr><td>2D</td><td></td><td>HALL OUT</td><td colspan="2" rowspan="2">Hall in/out adjustment</td><td></td></tr>
<tr><td>2E</td><td></td><td>HALL IN</td><td></td></tr>
<tr><td>2F</td><td></td><td>STILL THR1</td><td colspan="2"></td><td>02</td></tr>
<tr><td>30</td><td></td><td>STILL THR2</td><td colspan="2"></td><td>02</td></tr>
<tr><td>31</td><td></td><td>STILL THR3</td><td colspan="2"></td><td>01</td></tr>
<tr><td>32</td><td></td><td>FH W</td><td colspan="2"></td><td></td></tr>
<tr><td>33</td><td></td><td>FH B</td><td colspan="2"></td><td></td></tr>
<tr><td>34</td><td></td><td>AGC W</td><td colspan="2"></td><td></td></tr>
<tr><td>35</td><td></td><td>AGC B</td><td colspan="2"></td><td></td></tr>
<tr><td>36</td><td></td><td>ZOOM THR</td><td colspan="2"></td><td>18</td></tr>
<tr><td>37</td><td></td><td>IRIS THR</td><td colspan="2"></td><td>18</td></tr>
<tr><td>38</td><td></td><td>V PULSE</td><td colspan="2"></td><td>68</td></tr>
<tr><td>39</td><td></td><td>R32MSB</td><td colspan="2" rowspan="6">3200K preset data
(The data written in this column are inputted automatically when performing the auto white balance adjustment.)</td><td></td></tr>
<tr><td>3A</td><td></td><td>R32LSB</td><td></td></tr>
<tr><td>3B</td><td></td><td>B32MSB</td><td></td></tr>
<tr><td>3C</td><td></td><td>B32LSB</td><td></td></tr>
<tr><td>3D</td><td></td><td>G32MSB</td><td></td></tr>
<tr><td>3E</td><td></td><td>G32LSB</td><td></td></tr>
<tr><td>3F</td><td></td><td>START R</td><td rowspan="2">R CONT and B CONT data when starting the auto white balance operation.</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>40</td><td></td><td>START B</td><td></td></tr>
<tr><td>41</td><td></td><td>TM DIVID</td><td rowspan="2">Border value of the tracking frame</td><td rowspan="3">Auto white balance fixed data</td><td>44</td></tr>
<tr><td>42</td><td></td><td>BM DIVID</td><td>28</td></tr>
<tr><td>43</td><td></td><td>TOP SLP R</td><td>R CONT coefficient of the upper step of the tracking frame</td><td>80</td></tr>
</table>

Table 7-3. (2)

Adjustment adderss	**Adjustment voltage output terminal**	**Adjustment item**	**Remarks**		**Adjustment data memo column**
44		TOP SLP B	B CONT coefficient of the upper step of the tracking frame	Auto white balance adjustment	
45		MDL SLP R	R CONT and B CONT coefficient of the middle step of the tracking frame	Auto white balance fixed data	40
46		MDL SLP B			46
47		BTM SLP R			20
48		BTM SLP B			40
49		KEIKO R			60
4A		KEIKO B			30
4B		TOP UP	Upper and lower limit frames of the upper step of the tracking frame	Auto white balance adjustment	
4C		TOP DWN			
4D		MDL UP	Upper and lower limit frames of the upper, middle and lower steps of the tracking frame	Auto white balance fixed data	80
4E		MDL DWN			6E
4F		BTM UP			52
50		BTM DWN			3E
51		KEIKO DWN			69
52		R DWN LMT	R CONT data upper and lower limit of the tracking frame		1E
53		R UP LMT			64
54		B UP LMT	B CONT data upper limit of the tracking frame	Auto white balance adjustment	
55		IN BTOP	INDOOR operation frame upper limit of the tracking frame		
56		IN BMAX	B CONT data upper limit of INDOOR mode		
57		OUT BMIN	B CONT data lower limit of OUTDOOR mode		
58		OUT BTM	OUTDOOR mode operation frame lower limit of the tracking frame		
59		B DWN LMT	B CONT data lower limit of the tracking frame	Auto white balance fixed data	19
5A		R OUTDOOR	White balance preset data	Auto white balance adjustment	
5B		B OUTDOOR			
5C		Ra	R CONT and B CONT data of the points a, b and c on the curve of blackbody radiation		
5D		Rb			
5E		Rc			
5F		Ba			
60		Bb			
61		Bc			
62		R/B TOP	Slope data of the curve of blackbody radiation		
63		R/B MDL			
64		R/B BTM			
65		B/R TOP			
66		B/R MDL			
67		B/R BTM			

Table 7-3. (3)

<table>
<tr><th>Adjustment adderss</th><th>Adjustment voltage output terminal</th><th>Adjustment item</th><th colspan="2">Remarks</th><th>Adjustment data memo column</th></tr>
<tr><td>68</td><td></td><td>KEIKO</td><td>Indoor AWB data</td><td rowspan="9">Auto white balance fixed data</td><td>73</td></tr>
<tr><td>69</td><td></td><td>LL LMT</td><td>Minimum tracking illuminance</td><td>08</td></tr>
<tr><td>6A</td><td></td><td>B HUE KEI</td><td rowspan="5">Variable linear matrix data</td><td>00</td></tr>
<tr><td>6B</td><td></td><td>R GAIN OFF</td><td>00</td></tr>
<tr><td>6C</td><td></td><td>R GAIN KEI</td><td>00</td></tr>
<tr><td>6D</td><td></td><td>R HUE OFF</td><td>00</td></tr>
<tr><td>6E</td><td></td><td>R HUE KEI</td><td>00</td></tr>
<tr><td>6F</td><td></td><td>DELAY TM</td><td>Tracking speed</td><td>0C</td></tr>
<tr><td>70</td><td></td><td>FAST TM</td><td>Initial high speed tracking times</td><td>30</td></tr>
<tr><td>71</td><td></td><td>CAM DDS O</td><td colspan="2" rowspan="4">Fixed data</td><td>00</td></tr>
<tr><td>72</td><td></td><td>MODE</td><td>88</td></tr>
<tr><td>73</td><td></td><td>DSP MODE</td><td>00</td></tr>
<tr><td>74</td><td></td><td>CAM ALN</td><td>00</td></tr>
<tr><td>75</td><td></td><td>AWB MODE</td><td colspan="2">The following adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release, factory setting</td></tr>
<tr><td>10</td><td>Auto white balance adjustment mode</td></tr>
<tr><td>E0</td><td>3200K preset data read mode</td></tr>
<tr><td>F0</td><td>Auto white balance tracking zone discrimination invalid. All area discrimination mode.</td></tr>
</table></td><td>00</td></tr>
</table>

Table 7-3. (4)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the VC-80 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT	B1	N.C
A2	PG CONT	B2	N.C
A3	N.C	B3	Y (LPF) OUT
A4	Y0	B4	V SUB
A5	Y1	B5	AW ADJ
A6	C0	B6	$\overline{\text{CAM ADJ}}$
A7	C1	B7	OFF SET CONT
A8	CAM Y	B8	N.C
A9	YH	B9	N.C
A10	CAM C	B10	GND
A11	IRIS CONT	B11	IRIS DET

* N.C......no connection

Table 7-4.

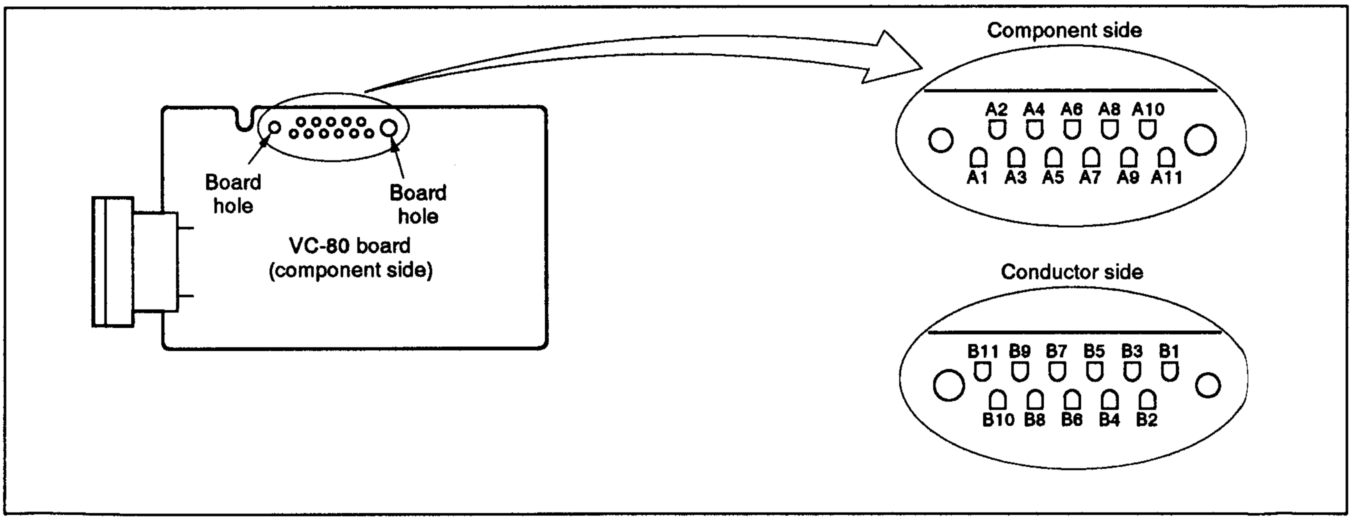

Component side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Board hole
Board hole
VC-80 board (component side)
Conductor side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2

Fig. 7-8.

7-1-6. AF Microprocessor Data Reading Jig

The AF microprocessor data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microprocessor (IC613 on VC-80 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:

Connect as shown in the diagram below.

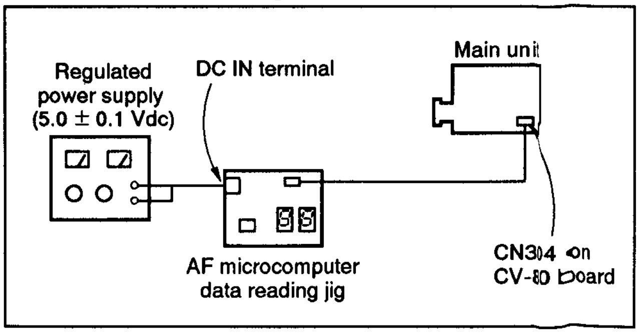

Regulated power supply (5.0 ± 0.1 Vdc)
DC IN terminal
Main unit
AF microcomputer data reading jig
CN304 on CV-80 board

Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microprocessor data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal — decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).
As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENTS

7-2-1. Flange Back Adjustment

Subject	Siemens star (2 m directly in front of lens reference plane (CCD imager))
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjusting Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (–) screwdriver

Adjusting method:

1) Press the FOCUS switch (S759 on CF-1 board) to set to the MANUAL mode.
2) Position a Siemens star 2 m directly in front of the lens reference plane (See Fig. 7-2.).
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (8.5 mm) and TELE position (68 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
5) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 07. (Iris open mode) At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
6) Set the lens focusing mark at the center of “2”.

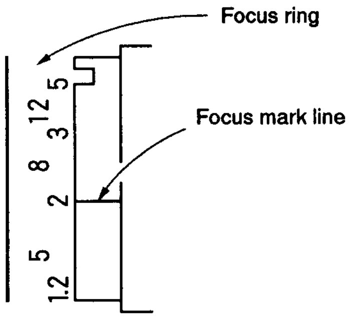


Fig. 7-10.

7) Loosen flange back setscrew ❶ with a Phillips screwdriver. (See Fig. 7-12.)
8) By turning the flange back adjusting Pin ❷ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
   Note: Do not turn the adjusting pin excessively in either direction.
9) While holding the flange back adjusting Pin ❷ to prevent further rotation, retighten the flange back setscrew ❶.
10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.2 m) and far (∞) extremes and confirm that the wedge is no longer in focus.

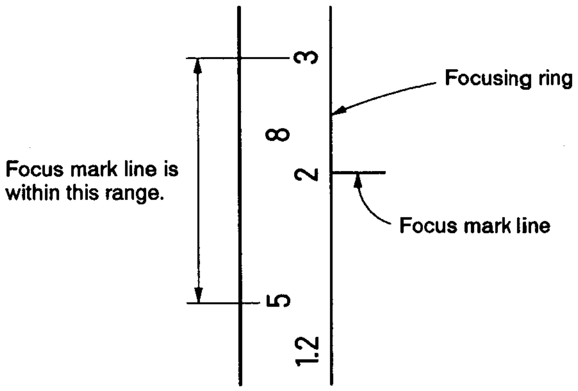


Fig. 7-11.

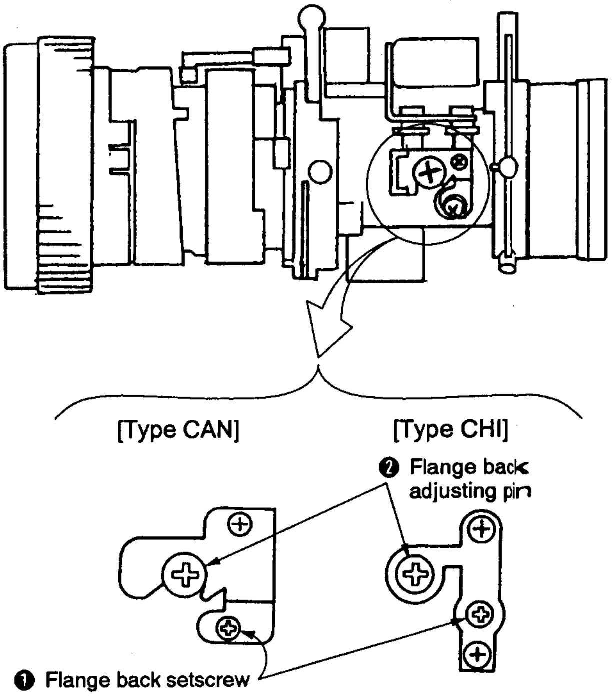


Fig. 7-12.

11) Fix the zoom lever at the extreme TELE position.
12) Turn the focusing ring and stop at the position where the wedge has optimum definition.
    Confirm that the focus mark is within ± 1.5 mm of “2”.
13) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 00. (Iris normal)
14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. Power Supply Check (VC-80 Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurement Point	Pin ④ of W801
Specified Value	4.95 ± 0.05 Vdc
23V Check	
Measurement Point	Pin ① of W801
Specified Value	23.08 ± 0.50 Vdc
15V Check	
Measurement Point	Pin ② of W801
Specified Value	15.0 ± 0.5Vdc
− 9V Check	
Measurement Point	Pin ③ of W801
Specified Value	−9.0 ± 0.5Vdc

Checking method:

1) Confirm that each power supply voltage meet the specified value.

4-2-3. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microprocessor (IC361 on VC-80 board) was replaced.

Adjustment address	Adjustment data initial value	Adjustment address	Adjustment data initial value	Adjustment address	Adjustment data initial value
01 (DELTA R)	50	2A (BASE H)	20	4D (MDL UP)	80
02 (DELTA B)	50	2B (LC-THR)	10	4E (MDL DWN)	6E
03(FADER OUT)	00	2C (SEARCH)	12	4F (BTM UP)	52
04 (C-PED)	A0	2F (STILL THR1)	02	50 (BTM DWN)	3E
0F (FADER LEVEL)	A0	30 (STILL THR2)	02	51 (KEIKO DWN)	69
12 (SYNC LEVEL)	90	31 (STILL THR3)	01	52 (R DWN LMT)	1E
13 (SET UP)	A0	32 (FH W)	00	53 (R TOP LMT)	64
14 (WC)	FF	33 (FH B)	01	59 (B DWN LMT)	19
15 (Y LEVEL)	A0	34 (AGC W)	10	68 (KEIKO)	73
17 (YH GAIN)	FF	35 (AGC B)	3F	69 (LL LMT)	08
19 (IRIS)	FF	36 (ZOOM THR)	18	6A (B HUE KEI)	00
1C (MAX GAIN)	C0	37 (IRIS THR)	18	6B (R GAIN OFF)	00
1D (AGC)	00	38 (V PULSE)	68	6C (R GAIN KEI)	00
1E (V SUB)	40	41 (TM DIVID)	44	6D (R HUE OFF)	00
20 (PG CONT)	A0	42 (BM DIVID)	28	6E (R HUE KEI)	00
22 (ZOOM L SPD)	44	43 (TOP SLP R)	80	6F (DELAY TM)	0C
23 (ZOOM H SPD)	44	45 (MDL SLP R)	40	70 (FAST TM)	30
24 (FOCUS SPEED)	50	46 (MDL SLP B)	46	71 (CAM DDSO)	00
26 (FG REF)	35	47 (BTM SLP R)	20	72 (MODE)	88
27 (MACRO)	09	48 (BTM SLP B)	40	73 (DSP MODE)	00
28 (IN/OUT DOOR)	1A	49 (KEIKO R)	60	74 (CAM ALN)	00
29 (BACK RUSH)	31	4A (KEIKO B)	30	75 (AWB MODE)	00

Table 7-6.

Adjusting method:

1) Set the RV701 (HALL ADJ) on the LD-33 board to the mechanical center.
2) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
3) Change the adjustment address to store the last adjustment data in the memory.

7-2-4. PLL Adjustment (VC-80 board)

Subject	Not needed
Measurement Point	R152 side terminal of C152 or Pin ⑳ of IC141
Measuring Instrument	Digital voltmeter
Adjustment Element	CT142
Specified Value	2.5 ± 0.2 Vdc

Adjusting method:
1) Adjust to 2.5 ± 0.2 Vdc with CT142.

7-2-5. PG CONT and VSUB Adjustment

1. PG CONT adjustment (VC-80 board)

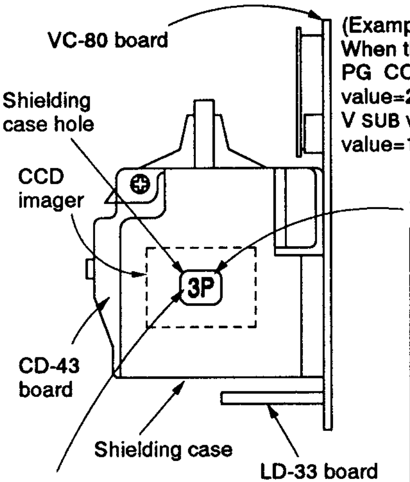
Subject	Not needed
Measurement Point	Pin (A2) (PG CONT) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	20 (PG CONT)
Specified Value	(Voltage indicated by the imager) ± 0.1 Vdc

Adjusting method:
1) Change the adjustment data at adjustment address 20 using the adjustment remote controller to set the PG CONT voltage to (voltage indicated by the imager) ± 0.1 Vdc.
2) Change the adjustment address to store the adjustment data in the memory.

2. VSUB adjustment (VC-80 board)

Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	1E (V SUB)
Specified Value	(Voltage indicated by the imager) ± 0.1 Vdc

Adjusting method:
1) Change the adjustment data at adjustment address 1E using the adjustment remote controller to set the VSUB voltage to (voltage indicated by the imager) ± 0.1 Vdc.
2) Change the adjustment address to store the adjustment data in the memory.



(Example)
When the indication is 3P;
PG CONT voltage specified value=2.0 ± 0.1 Vdc
V SUB voltage specified value=13.5 ± 0.1 Vdc

PG CONT voltage code

Code	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

V SUB voltage code

Code	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-13.

7-2-6. Hall Adjustment (LD-33 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304 on the VC-80 board
Measuring Instrument	AF microprocessor data reading jig
Adjusment Address	1B (Hall Offset)
Adjusting Element	RV701
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin (A11) (IRIS CONT) of the check point array and CAM 5V (Pin ④ of W801).

Adjusting method:

1) Set RV701 to the mechanical center.
2) Set the adjustment address to 25 with the adjustment remote controller, and set the adjustment data to 05. At the same time, connect Pin (A11) of the check point array and CAM 5V using 1 kΩ resistance. (Setting when iris closed)
3) Change the adjustment address to 1B.
4) Change the adjustment data until the indication on the AF microprocessor data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
5) Change the adjustment address to 25 and set the adjustment data to 07. At the same time, remove the 1 kΩ resistance at Pin (A11) of the check point array. (Setting when iris open)
6) Adjust RV701 until the indication on the AF microcomputer data reading jig is either 3D or 3E. (3D is indicated as 3 d .)
7) Repeat steps 2) through 6) until meet the specified values.
8) Set the adjustment address to 25 and set the adjustment data to 00. (Releases adjustment mode)
9) Change the adjustment address to store the adjustment data in the memory.

7-2-7. Iris Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin(B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (Iris)
Specified Value	150 ± 10 mVp-p

Adjusting method:

1) Set the adjustment address to 19 with the adjustment remote controller.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 150 ± 10 mVp-p.
3) Attach the ND filter 0.5 (0.4+0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 150 ± 10 mVp-p.
5) Repeat 2) through 4) if the specified value is not met.
6) Change the adjustment address to store the adjustment data in the memory.

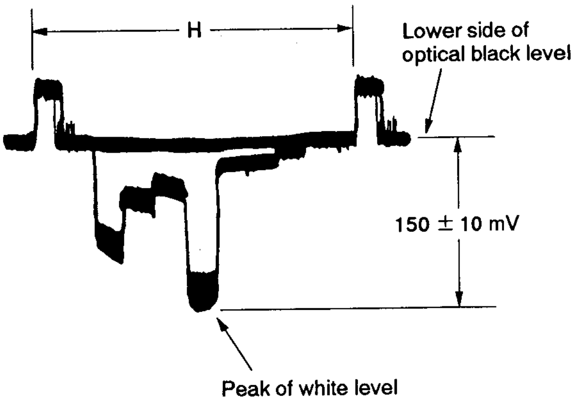


Fig. 7-14.

7-2-8. Hall In/Out Adjustment (VC-80 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	2E (HALL IN) 2D (HALL OUT)

Adjusting method:

1) Cover the lens with the ND filter 0.8 (0.4+0.4).
2) Set the adjustment address to 25 with the adjustment remote controller and set the adjustment data to 09.
   (Hall in/out threshold mode setting)
3) Read the data indicated on the AF microprocessor data reading jig and set this data to the adjustment address 2E.
4) Remove the ND filter 0.8 and replace it with ND filter 0.5 (0.4+0.1).
5) Read the data indicated on the AF microprocessor data reading jig and set this data to the adjustment address 2D.
6) Change the adjustment address to 25 and set the adjustment data to 00. (Releases hall in/out threshold mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-9. AGC Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B3) (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	1D (AGC)
Specified Value	160 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 1D using the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Y (LPF) signal level to 160 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

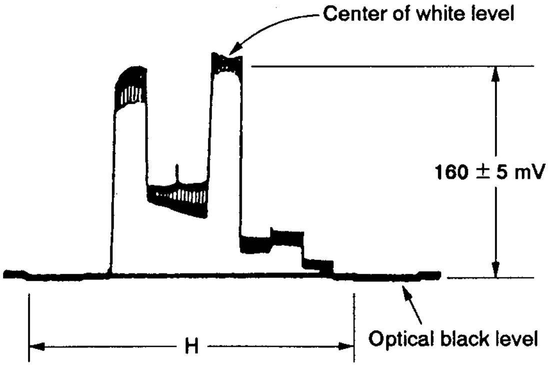


Fig. 7-15.

7-2-10. Y Signal Matrix Adjustment (VC-80 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A4) (Y0) of check point array 2: Pin (A5) (Y1) of check point array
Measuring Instrument	Oscilloscope^{Note}
Adjustment Address	0E (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Note: Attach 10 kΩ resistor to tip of the probe (10:1).

Adjusting method:

1) Connect the oscilloscope to Pin (A4) of the check point array and measure the Y0 signal level.
2) Connect the oscilloscope to Pin (A5) of the check point array.
3) Set the adjustment address to 0E using the adjustment remote controller.
4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

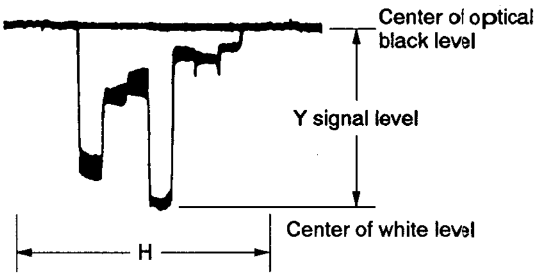


Fig. 7-16.

7-2-11. Chroma Signal Matrix Adjustment (1) (VC-80 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin Ⓐ6 (C0) of check point array 2: Pin Ⓐ7 (C1) of check point array
Measuring Instrument	Oscilloscope$^{\text{Note}}$
Adjustment Address	0D (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Note: Attach 10 kΩ resistor to tip of the probe (10:1).

Adjusting method:

1) Connect the oscilloscope to Pin Ⓐ6 of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
2) Connect the oscilloscope to Pin Ⓐ7 of the check point array.
3) Set the adjustment address to 0D using the adjustment remote controller.
4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

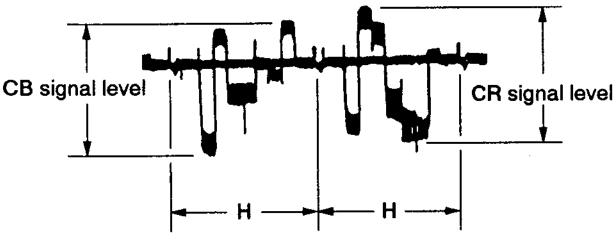


Fig. 7-17. C0 and C1 signal levels

7-2-12. Chroma Signal Matrix Adjustment (2) (VC-80 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	18 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: VIDEO output terminal)

Adjusting method:

1) Set the adjustment address to 18 using the adjustment remote controller.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Change the adjustment address to store the adjustment data in the memory.

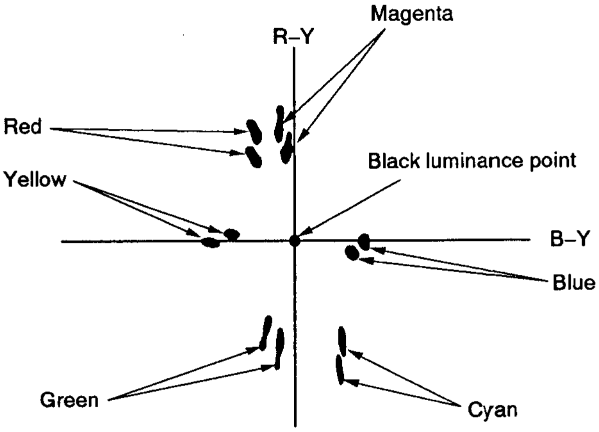


Fig. 7-18.

7-2-13. YH Level Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin(A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	17 (YH GAIN)
Specified Value	900 ± 40 mVp-p

Adjusting method:

1) Set the adjustment address to 17 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the YH signal level to 900 ± 40 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

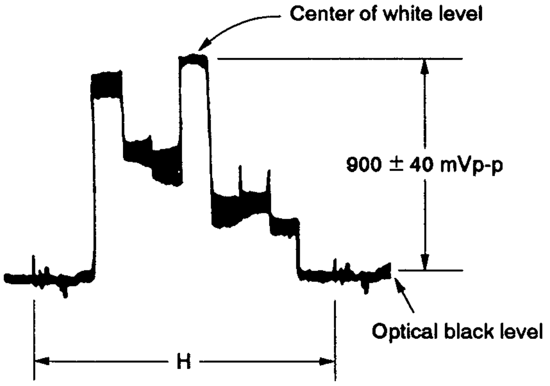


Fig. 7-19.

7-2-14. Sync Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8)(CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	12 (SYNC LEVEL)
Specified Value	300 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 12 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the sync level to 300 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

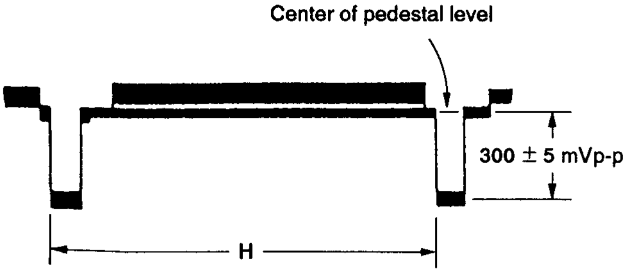


Fig. 7-20.

7-2-15. Setup Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8)(CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	13 (SET UP)
Specified Value	30 ± 10 mV

Note: 1) and 2) are steps taken to reduce noise.

Adjusting method:

1) Set the address to 16 (APERTURE) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
2) Set the address to 1C (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
3) Set the adjustment address to 13 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the setup level to 30 ± 10 mV.
5) Set the adjustment address to 16 and enter the adjustment data recorded in 1).
6) Set the adjustment address to 1C and enter the adjustment data recorded in 2).
7) Change the adjustment address to store the adjustment data in the memory.

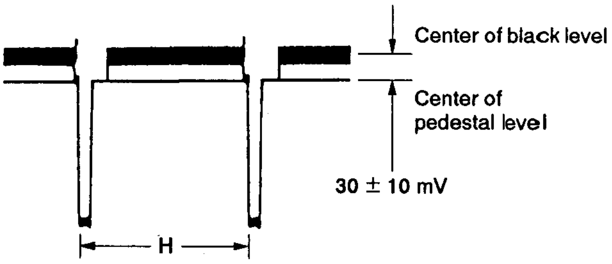


Fig. 7-21.

7-2-16. White Clip Adjustment (VC-80 Board)

Subject	High luminance pattern
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (WHITE CLIP)
Specified Value	840 ± 20 mV

Adjusting method:

1) Set the adjustment address to 15 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to 40 with the adjustment remote controller.
3) Set the adjustment address to 14 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the white clip level to 840 ± 20 mV.
5) Set the adjustment address to 15 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

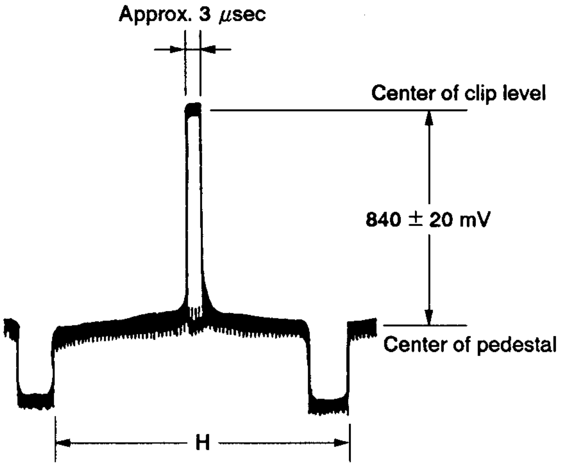


Fig. 7-22.

7-2-17. Y Level Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	15 (Y LEVEL)
Specified Value	640 ± 10 mV

Adjusting method:

1) Set the adjustment address to 14 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to FF with the adjustment remote controller.
3) Set the adjustment address to 15 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 640 ± 10 mV.
5) Set the adjustment address to 14 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

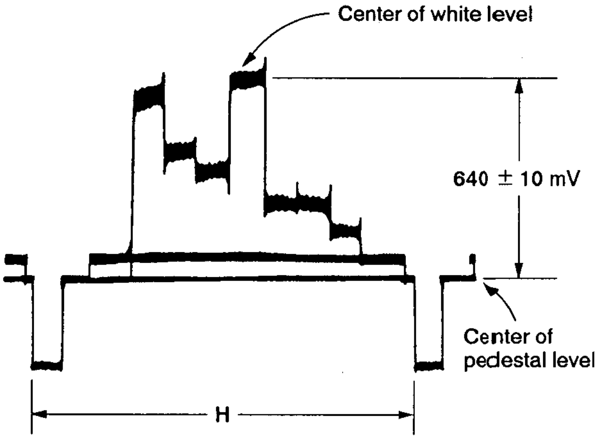


Fig. 7-23.

7-2-18. Max. Gain Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two), 0.4 (one) and 0.1 (one)
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	1C (MAX GAIN)
Specified Value	260 ± 10 mV

Adjusting method:

1) Cover the lens with the ND filter 2.5 (1.0+1.0+0.4+0.1).
2) Set the adjustment address to 1C with the adjustment remote controller.
3) Change the adjustment data with the adjustment remote controller to set the Y signal level to 260 ± 10 mV.
4) Change the adjustment address to store the adjustment data in the memory.

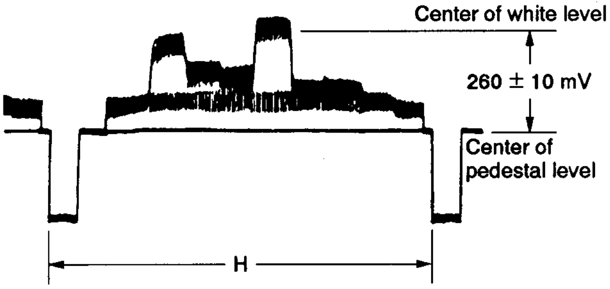


Fig. 7-24.

7-2-19. Aperture Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	16 (APERTURE)
Specified Value	260 ± 10 mV

Adjusting method:

1) Set the adjustment address to 16 with the adjustment remote controller.
2) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
3) Change the adjustment data to set the lower peak between green and white to 260 ± 10 mV above the pedestal level.
4) Change the adjustment address to store the adjustment data in the memory.

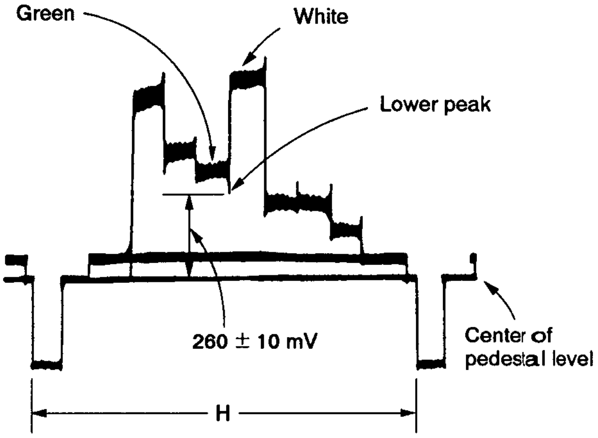


Fig. 7-25.

7-2-20. Chroma Level Adjustment (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	320 ± 20 mVp-p

Connections:

1) Connect Pin (B7) (OFFSET CONT) of the check point array to GND using a jumper wire.

Adjusting method:

1) Set the adjustment address to 09 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the G OUT signal level to 320 ± 20 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

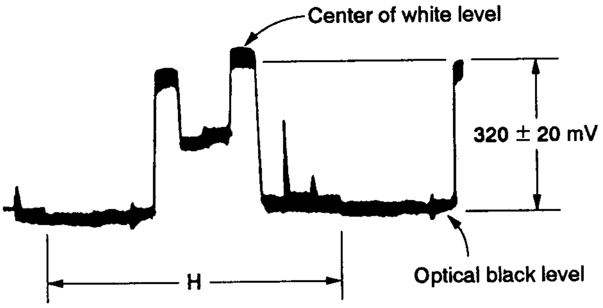


Fig. 7-26.

7-2-21. Burst Phase Adjustment (Method Using Vectorscope)

Subject	All black (cover lens with black cap)
Measurement Point	VIDEO output terminal
Measuring Instrument	Vectrscope
Adjustment Address	11 (HUE CONT)
Specified Value	135° ± 2°

Adjustment method:

1) Set adjustment address to 11 with the adjustment remote controller.
2) Change adjustment data so as to set the burst luminance point in the 135° ± 2° position.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

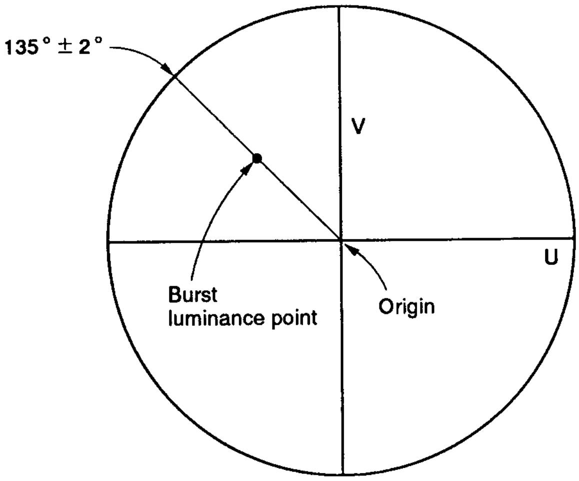


Fig. 7-27.

7-2-22. Burst Phase Adjustment (VC-80 Board) (Mothod Using Oscilloscope)

Subject	All black (cover lens with black cap)
Measurement Point	VIDEO output terminal
Measuring Instrument	Oscilloscope (Trigger slope:+)
Adjustment Address	11 (HUE CONT)
Specified Value	Burst phase should become a single line.

Adjusing method:

1) Set adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data so as to turn the burst waveform into a single line.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

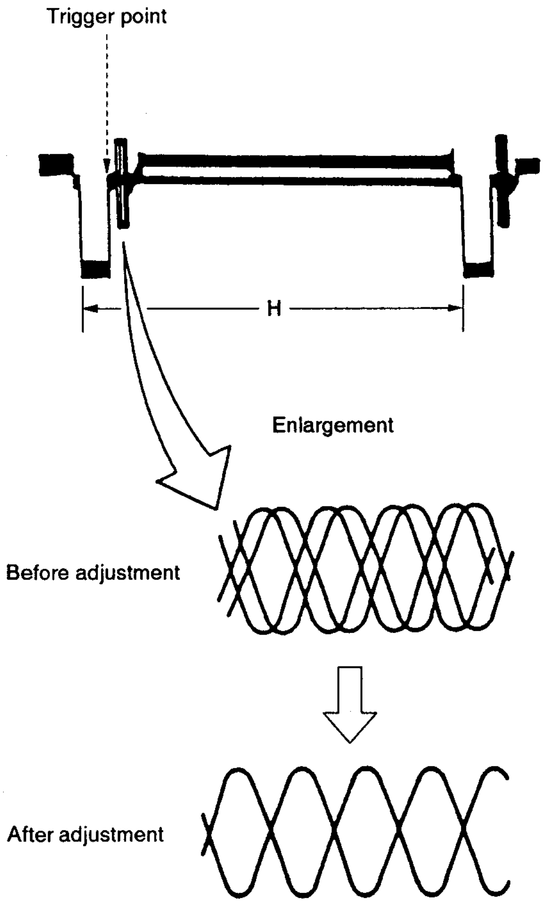


Fig. 7-28.

7-2-23. Burst Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (BURST LEVEL)
Specified Value	200 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 10 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the burst level to 200 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

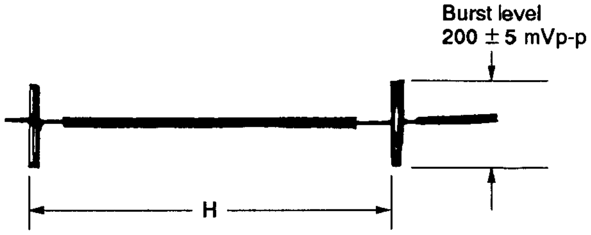


Fig. 7-29.

7-2-24. Indoor White Balance Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal
Measuring Instrument	Vectorscope
Adjustment Address	0B (R GAIN) 0C (B GAIN)
Specified Value	The center of the white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjusting method:

1) Set the adjustment address to 0B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the origin.
3) Set the adjustment address to 0C.
4) Change the adjustment data to match the white luminance point with the origin.
5) Repeat steps 1) through 4).
   (Each adjustment data should be 60 to FF.)
6) Change the adjustment address to store the adjustment data in the memory.

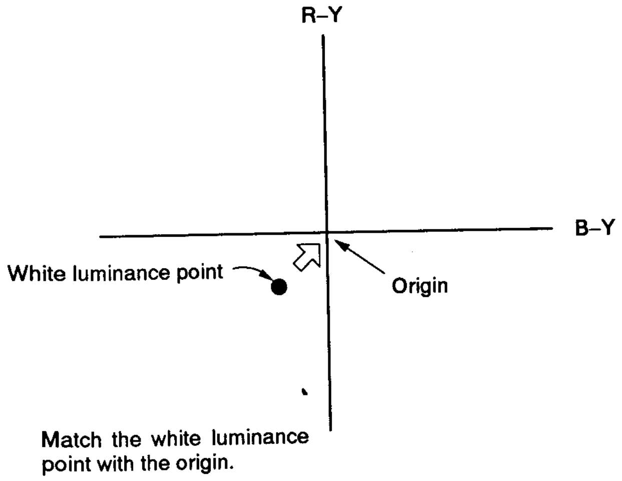


Fig. 7-30.

7-2-25. Indoor White Balance Adjustment (Method Using Oscilloscope) (VC-80 Board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	0B (R GAIN) 0C (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjusting method:

1) Set the adjustment address to 0B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the black luminance point.
3) Set the adjustment address to 0C.
4) Change the adjustment data to match the white luminance point with the black luminance point.
5) Repeat steps 1) through 4).
   (Each adjustment data should be 60 to FF.)
6) Change the adjustment address to store the adjustment data in the memory.

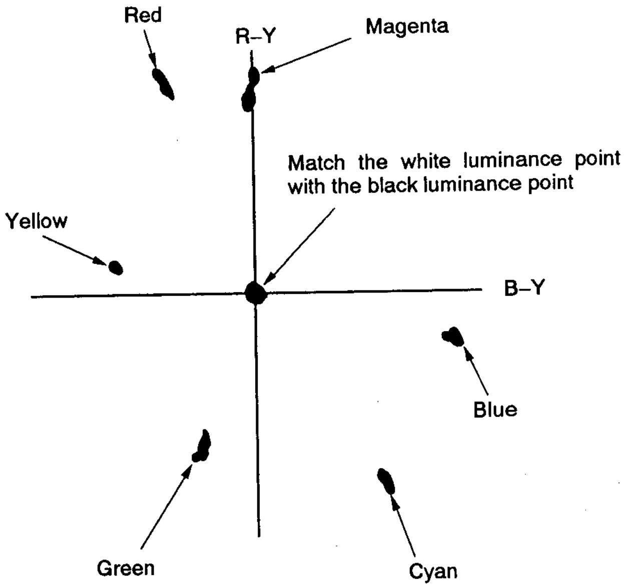

Red
R–Y
Magenta
Match the white luminance point with the black luminance point
Yellow
B–Y
Blue
Green
Cyan

Fig. 7-31.

7-2-26. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO output terminal
Measuring Instrument	Vectorscope
Adjustment Address	05 (R–Y GAIN) 07 (R–Y HUE) 06 (B–Y GAIN) 08 (B–Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that "Burst Phase Adjustmenr" "Burst Level Adjustment" and "Indoor White Balance Adjustment" have been completed.

Adjusting method:
1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
2) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame. (Each adjustment data should be 40 to FF.)
3) Change the adjustment address to store the adjustment data in the memory.

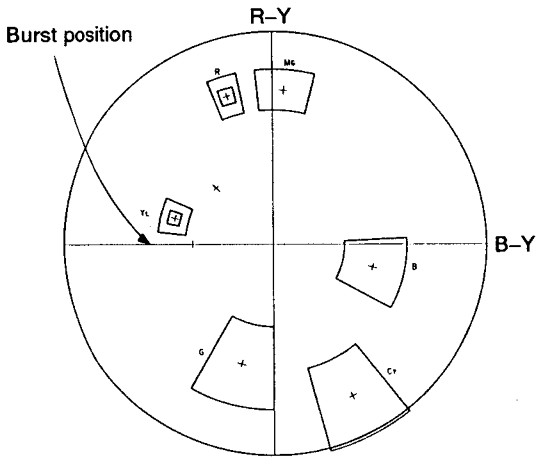


Fig. 7-32.

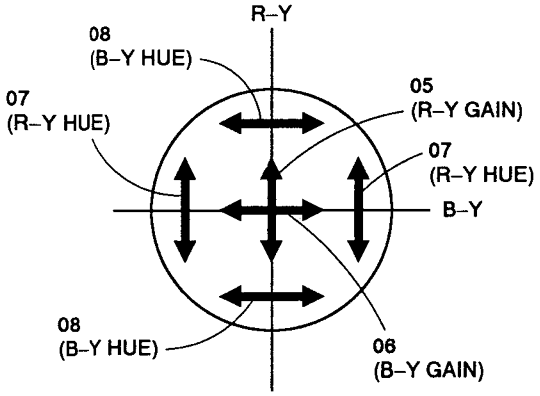


Fig. 7-33. Adjustment address and direction of luminance point movement

7-2-27. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (VC-80 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R–Y GAIN) 06 (B–Y GAIN)
Specified Value	Red level: 387 ± 22 mVp-p Yellow level: 255 ± 16 mVp-p

Note: Confirm that "Indoor White Balance Adjustment" is completed.

Adjusting method:
1) Set the adjustment address to 06 with the adjustment remote controller and set the adjustment data to B0.
2) Set the adjustment address to 07 and set the adjustment data to C0.
3) Set the adjustment address to 08 and set the adjustment data to C0.
4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal "red" level to 387 ± 22 mVp-p.
5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal "yellow" level to 255 ± 16 mVp-p.
6) Repeat steps 4) and 5).
(Each adjustment data should be 40 to FF.)
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform "Hue Adjustment".

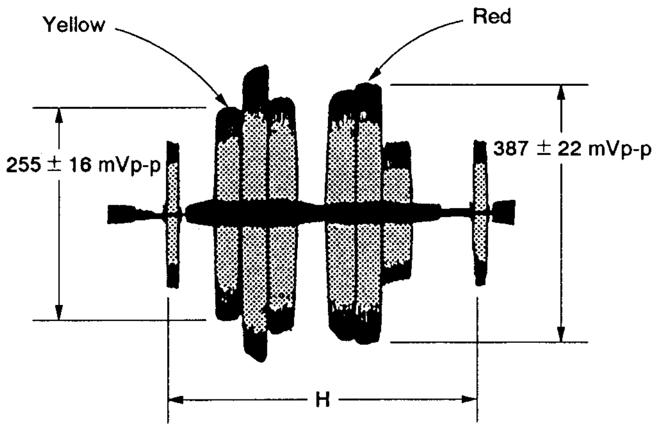


Fig. 7-34.

2. Hue adjustment (VC-80 board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (R–Y HUE) 08 (B–Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that "Indoor White Balance Adjustment" is completed.

Adjusting method:
1) Match the "black" luminance point on the oscilloscope with the origin of the color reproduction frame.
2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary. (Each adjustment data should be 40 to FF.)
4) Set the oscilloscope to the normal mode and connect it to Pin (A10) of the check point array and confirm that the specified value of "1. Gain Adjustment" is satisfied. Change the data at the adjustment address 05 and 06 if the specified value is not met.
5) Change the adjustment address to store the adjustment data in the memory.

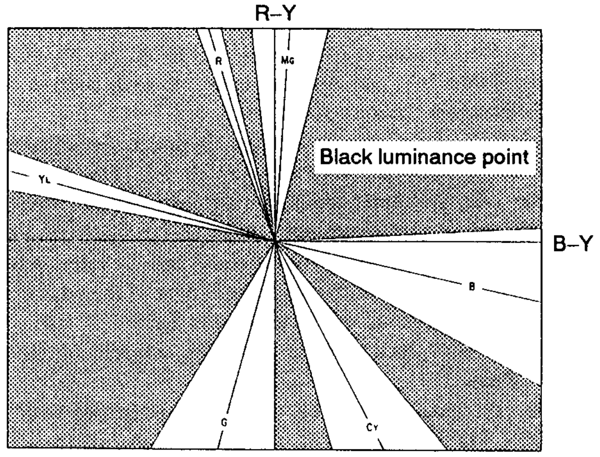


Fig. 7-35.

7-2-28. Auto White Balance Adjustment

Note: Be sure to first perform "Preset Adjustment" followed by "Auto White Balance Adjustment".

1. Preset adjustment (VC-80 board)

Subject	White pattern standard picture frame

Note: 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, once OFF/ON the power.

Preparations:
1) Prepare a 1 kΩ resistor for connecting Pin (B5) (AW ADJ) of the check point array and Pin ④ (CAM 5V) of W801.

Adjusting method:
1) Connect the Pin (B6) (CAM ADJ) of the check point array to the ground with a jumper wire after turning the power OFF and ON. Wait at least 30 seconds.
2) Select adjustment address 75 (AWB MODE) and set the adjustment data to E0.
3) Change the adjustment address to store the adjustment data in the memory.
4) Remove the jumper wire between Pin (B6) (CAM ADJ) of the check point array and the ground.
5) Connect Pin (B5) (AWB ADJ) of the check point array and Pin ④ of W801 (CAM 5V) with a 1 kΩ resistor.
6) Connect Pin (B6) (CAM ADJ) of the check point array to the ground using a jumper wire.
7) Confirm that the data indicated (address 01) on the adjustment remote controller is changed.
8) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array after elapse of one second or more.
9) Remove the 1 kΩ resistor connected to Pin (B5) (AWB ADJ) of the check point array.
10) Connect Pin (B6) (CAM ADJ) of the check point array to the ground using a jumper wire.
11) Perform the following "Auto white balance adjustment".

2. Auto white balance adjustment (VC-80 board)

Note: Be sure to perform "Preset adjustment" before this adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)$^{\text{Note 1}}$
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Adjustment Address	01 (DELTA R) 02 (DELTA B) 3F (START R) 40 (START B) 44 (TOP SLP B) 4B (TOP UP) 4C (TOP DWN) 54 (B UP LMT) 55 (IN BTOP) 56 (IN BMAX) 57 (OUT BMIN) 58 (OUT BDWN) 5A (R OUTDOOR) 5B (B OUTDOOR) 5C (Ra) 5D (Rb) 5E (Rc) 5F (Ba) 60 (Bb) 61 (Bc) 62 (R/B TOP) 63 (R/B MDL) 64 (R/B DWN) 65 (B/R TOP) 66 (B/R MDL) 67 (B/R DWN)
Specified Value	Line up the white luminance point with the black luminance point.

Note: 1) Adjustment can be made in the same manner using a vectorscope.
Connect to VIDEO output terminal when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjusting method:

- Outdoor preset adjustment

1) Select the adjustment address 75 (AWB MODE) with the adjustment remote controller and set the adjustment data to 10.
2) Cover the lens with C14 filter.
3) Change the adjustment data at the adjustment addresses 01 and 02 alternately with the adjustment remote controller to match the white luminance point with the black luminance point. (Match the white luminance point with the origin when using the vectorscope.)
The adjustment data of adjustment address 01 will be C_1 and the adjustment data of adjustment address 02 will be C_2.

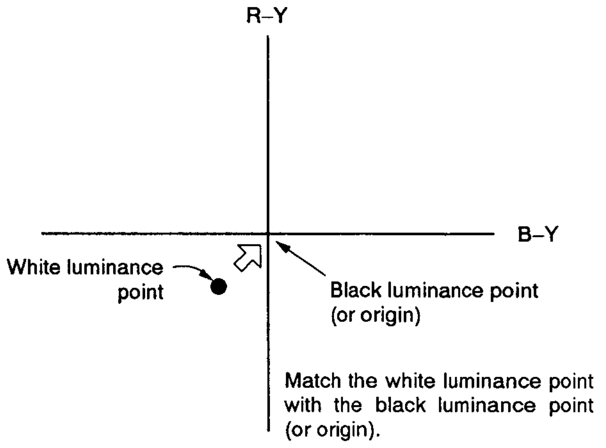

R–Y
B–Y
White luminance point
Black luminance point (or origin)
Match the white luminance point with the black luminance point (or origin).

Fig. 7-36.

- Adjustment data input with the tables

4) When C_2 value is from 3F through 55, obtain the adjustment data at the adjustment addresses 40, 54 to 58, 5B, 5F, 60 and 61 by Table 7-7., and enter the data into each address with the adjustment remote controller.
5) When C_1 value is from 25 through 30, obtain the adjustment data at the adjustment addresses 3F, 5A, 5C, 5D and 5E with Table 7-8., and enter the data into each address with the adjustment remote controller.
6) When C_1 value is from 25 through 30 and C_2 value is from 3F through 55, obtain the adjustment data of the adjustment addresses 44, 4B, 4C and 62 to 67 with Table 7-9., and enter the data into each address with the adjustment remote controller.
7) When the data input to all adjustment addresses with the Tables has completed in 4) through 6), perform the adjustments after 15). If there is the adjustment address in which the data input is impossible, perform the following "Adjustment data input by calculation".

- Adjustment data input by calculation

8) Convert the adjustment data C_1 to decimal to obtain C_1', and the adjustment data C_2 to decimal to obtain C_2'.
(See Table 7-5. Hexadecimal — decimal conversion table)
9) Obtain R' and B' by the following formula.
$R' = C_1' + 2$
$B' = C_2' + 4$
10) Convert R' to hexadecimal and enter it into the adjustment address 5A.
11) Convert B' to hexadecimal and enter it into the adjustment address 5B.
12) Obtain X' and Y' by the following formula.
$X' = 64 - R'$
$Y' = B' - 48$
13) Obtain the adjustment data (decimal) by the following formula, convert to hexadecimal and enter the data into each adjustment address. (When converting, if there is a fraction under decimal, round it off.) Still, take down each adjustment data (decimal).
Address 54
$D_{54}' = Y' \times 2 + 48$
Address 55
$D_{55}' = B'$
Address 56
$D_{56}' = Y' \times 0.84 + 48$
Address 57
$D_{57}' = D_{56}'$
Address 58
$D_{58}' = Y' \times 0.3 + 48$
Address 5C
$D_{5C}' = 64 - X' \times 1.12$
Address 5D
$D_{5D}' = R'$
Address 5E
$D_{5E}' = 64 - X' \times 0.593$
Address 5F
$D_{5F}' = Y' \times 1.34 + 48$
Address 60
$D_{60}' = B'$
Address 61
$D_{61}' = Y' \times 0.467 + 48$
14) Obtain the adjustment data (decimal) by the following formula, convert to hexadecimal and enter the data into each adjustment address. (Round fractions off.)
Address 62
$D_{62}' = (D_{5D}' - D_{5C}') \times 64 / (D_{5F}' - D_{60}')$
Address 63
$D_{63}' = (D_{5E}' - D_{5D}') \times 64 / (D_{60}' - D_{61}')$
Address 64
$D_{64}' = (64 - D_{5E}') \times 64 / (D_{61}' - 48)$
Address 65
$D_{65}' = (D_{5F}' - D_{60}') \times 16 / (D_{5D}' - D_{5C}')$
Address 66
$D_{66}' = (D_{60}' - D_{61}') \times 16 / (D_{5E}' - D_{5D}')$
Address 67
$D_{67}' = (D_{61}' - 48) \times 16 / (64 - D_{5E}')$
Address 44
$D_{44}' = D_{62}' \times 1.8$
Address 4B
$D_{4B}' = D_{5C}' \times 2 + 16 + (D_{5F}' \times D44')/64$
Address 4C
$D_{4C}' = D_{5C}' \times 2 - 14 + (D_{5F}' \times D44')/64$
Address 3F
$D_{3F}' = D_{5E}'$
Address 40
$D_{40}' = D_{61}'$

- Auto white balance adjustment

15) Check the C14 filter is covered with the lens.
16) Select the adjustment address 75, and enter the adjustment data F0.
17) Change alternately the adjustment data at the adjustment addresses 01 and 02 with the adjustment remote controller to match the white luminance point with the black luminance point.
(Match the white luminance with the origin when using the vectorscope.)
18) Select the adjustment address 75, and enter the adjustment data 00.
19) Change the adjustment address to store the adjustment data in the memory.

(Example)

If C2 is 49, the Ⓐ line is the required adjustment data.

C2	Adjustment address										
	40	54	55	56	57	58	5B	5F	60	61	
3F	39	56	43	40	40	36	43	49	43	39	
40	39	58	44	41	41	36	44	4B	44	39	
41	3A	5A	45	42	42	36	45	4C	45	3A	
42	3A	5C	46	42	42	37	46	4D	46	3A	
43	3B	5E	47	43	43	37	47	4F	47	3B	
44	3B	60	48	44	44	37	48	50	48	3B	
45	3C	62	49	45	45	38	49	52	49	3C	
46	3C	64	4A	46	46	38	4A	53	4A	3C	
47	3D	66	4B	47	47	38	4B	54	4B	3D	
48	3D	68	4C	48	48	38	4C	56	4C	3D	
49	3E	6A	4D	48	48	39	4D	57	4D	3E	←Ⓐ
4A	3E	6C	4E	49	49	39	4E	58	4E	3E	
4B	3E	6E	4F	4A	4A	39	4F	5A	4F	3E	
4C	3F	70	50	4B	4B	3A	50	5B	50	3F	
4D	3F	72	51	4C	4C	3A	51	5C	51	3F	
4E	40	74	52	4D	4D	3A	52	5E	52	40	
4F	40	76	53	4D	4D	3B	53	5F	53	40	
50	41	78	54	4E	4E	3B	54	60	54	41	
51	41	7A	55	4F	4F	3B	55	62	55	41	
52	42	7C	56	50	50	3B	56	63	56	42	
53	42	7E	57	51	51	3C	57	64	57	42	
54	43	80	58	52	52	3C	58	66	58	43	
55	43	82	59	52	52	3C	59	67	59	43	

Table 7-7.

C1	Adjustment address				
	3F	5A	5C	5D	5E
25	31	27	24	27	31
26	32	28	25	28	32
27	32	29	26	29	32
28	33	2A	27	2A	33
29	34	2B	28	2B	34
2A	34	2C	2A	2C	34
2B	35	2D	2B	2D	35
2C	35	2E	2C	2E	35
2D	36	2F	2D	2F	36
2E	37	30	2E	30	37
2F	37	31	2F	31	37
30	38	32	30	32	38

Table 7-8.

C1	C2	Adjustment address								
		44	4B	4C	62	63	64	65	66	67
25	3F	3A	9A	7C	20	40	6B	20	10	A
	40	31	92	74	1B	3A	6B	25	12	A
	41	31	93	75	1B	3A	60	25	12	B
	42	31	93	75	1B	35	60	25	13	B
	43	2B	8D	6F	18	35	57	2B	13	C
	44	2B	8E	70	18	31	57	2B	15	C
	45	26	89	6B	15	31	50	30	15	D
	46	26	8A	6C	15	2E	50	30	16	D
	47	26	8A	6C	15	2E	4A	30	16	E
	48	23	86	68	13	2B	4A	35	18	E
	49	23	87	69	13	2B	45	35	18	F
	4A	23	87	69	13	28	45	35	1A	F
	4B	1F	84	66	11	26	45	3B	1B	F
	4C	1F	85	67	11	26	40	3B	1B	10
	4D	1F	85	67	11	24	40	3B	1D	10
	4E	1D	82	64	10	24	3C	40	1D	11
	4F	1D	83	65	10	22	3C	40	1E	11
	50	1D	83	65	10	22	38	40	1E	12
	51	1B	81	63	F	20	38	45	20	12
	52	1B	81	63	F	20	35	45	20	13
	53	1B	81	63	F	1E	35	45	22	13
	54	19	7F	61	E	1E	33	4B	22	14
	55	19	80	62	E	1D	33	4B	23	14
26	3F	3A	9C	7E	20	40	64	20	10	A
	40	31	94	76	1B	3A	64	25	12	A
	41	31	95	77	1B	3A	5A	25	12	B
	42	31	95	77	1B	35	5A	25	13	B
	43	2B	8F	71	18	35	51	2B	13	D
	44	2B	90	72	18	31	51	2B	15	D
	45	26	8B	6D	15	31	4B	30	15	E
	46	26	8C	6E	15	2E	4B	30	16	E
	47	26	8C	6E	15	2E	45	30	16	F
	48	23	88	6A	13	2B	45	35	18	F
	49	23	89	6B	13	2B	40	35	18	10
	4A	23	89	6B	13	28	40	35	1A	10
	4B	1F	86	68	11	26	40	3B	1B	10
	4C	1F	87	69	11	26	3C	3B	1B	11
	4D	1F	87	69	11	24	3C	3B	1D	11
	4E	1D	84	66	10	24	38	40	1D	12
	4F	1D	85	67	10	22	38	40	1E	12
	50	1D	85	67	10	22	35	40	1E	13
	51	1B	83	65	F	20	35	45	20	13
	52	1B	83	65	F	20	32	45	20	15
	53	1B	83	65	F	1E	32	45	22	15
	54	19	81	63	E	1E	2F	4B	22	16
	55	19	82	64	E	1D	2F	4B	23	16
27	3F	3A	9E	80	20	3A	64	20	12	A
	40	31	96	78	1B	34	64	25	14	A
	41	31	97	79	1B	34	5A	25	14	B
	42	31	97	79	1B	30	5A	25	15	B
	43	2B	91	73	18	30	51	2B	15	D
	44	2B	92	74	18	2C	51	2B	17	D
	45	26	8D	6F	15	2C	4B	30	17	E
	46	26	8E	70	15	29	4B	30	19	E
	47	26	8E	70	15	29	45	30	19	F
	48	23	8A	6C	13	26	45	35	1B	F
	49	23	8B	6D	13	26	40	35	1B	10
	4A	23	8B	6D	13	24	40	35	1C	10
	4B	1F	88	6A	11	22	40	3B	1E	10
	4C	1F	89	6B	11	22	3C	3B	1E	11
	4D	1F	89	6B	11	20	3C	3B	20	11
	4E	1D	86	68	10	20	38	40	20	12
	4F	1D	87	69	10	1E	38	40	22	12
	50	1D	87	69	10	1E	35	40	22	13
	51	1B	85	67	F	1D	35	45	24	13
	52	1B	85	67	F	1D	32	45	24	15
	53	1B	85	67	F	1B	32	45	25	15
	54	19	83	65	E	1B	2F	4B	25	16
	55	19	84	66	E	1A	2F	4B	27	16

Table 7-9. (1)

C1	C2	Adjustment address								
		44	4B	4C	62	63	64	65	66	67
28	3F	3A	A0	82	20	3A	5C	20	12	B
	40	31	98	7A	1B	34	5C	25	14	B
	41	31	99	7B	1B	34	53	25	14	C
	42	31	99	7B	1B	30	53	25	15	C
	43	2B	93	75	18	30	4C	2B	15	E
	44	2B	94	76	18	2C	4C	2B	17	E
	45	26	8F	71	15	2C	45	30	17	F
	46	26	90	72	15	29	45	30	19	F
	47	26	90	72	15	29	40	30	19	10
	48	23	8C	6E	13	26	40	35	1B	10
	49	23	8D	6F	13	26	3B	35	1B	11
	4A	23	8D	6F	13	24	3B	35	1C	11
	4B	1F	8A	6C	11	22	3B	3B	1E	11
	4C	1F	8B	6D	11	22	37	3B	1E	12
	4D	1F	8B	6D	11	20	37	3B	20	12
	4E	1D	88	6A	10	20	34	40	20	14
	4F	1D	89	6B	10	1E	34	40	22	14
	50	1D	89	6B	10	1E	31	40	22	15
	51	1B	87	69	F	1D	31	45	24	15
	52	1B	87	69	F	1D	2E	45	24	16
	53	1B	87	69	F	1B	2E	45	25	16
	54	19	85	67	E	1B	2C	4B	25	17
	55	19	86	68	E	1A	2C	4B	27	17
29	3F	3A	A2	84	20	3A	55	20	12	C
	40	31	9A	7C	1B	34	55	25	14	C
	41	31	9B	7D	1B	34	4D	25	14	D
	42	31	9B	7D	1B	30	4D	25	15	D
	43	2B	95	77	18	30	46	2B	15	F
	44	2B	96	78	18	2C	46	2B	17	F
	45	26	91	73	15	2C	40	30	17	10
	46	26	92	74	15	29	40	30	19	10
	47	26	92	74	15	29	3B	30	19	11
	48	23	3E	70	13	26	3B	35	1B	11
	49	23	8F	71	13	26	37	35	1B	13
	4A	23	8F	71	13	24	37	35	1C	13
	4B	1F	8C	6E	11	22	37	3B	1E	13
	4C	1F	8D	6F	11	22	33	3B	1E	14
	4D	1F	8D	6F	11	20	33	3B	20	14
	4E	1D	8A	6C	10	20	30	40	20	15
	4F	1D	8B	6D	10	1E	30	40	22	15
	50	1D	8B	6D	10	1E	2D	40	22	17
	51	1B	89	6B	F	1D	2D	45	24	17
	52	1B	89	6B	F	1D	2B	45	24	18
	53	1B	89	6B	F	1B	2B	45	25	18
	54	19	87	69	E	1B	28	4B	25	19
	55	19	88	6A	E	1A	28	4B	27	19
2A	3F	26	90	72	15	33	55	30	14	C
	40	21	8B	6D	12	2F	55	38	16	C
	41	21	8B	6D	12	2F	4D	38	16	D
	42	21	8C	6E	12	2B	4D	38	18	D
	43	1D	87	69	10	2B	46	40	18	F
	44	1D	88	6A	10	27	46	40	1A	F
	45	1A	85	67	E	27	40	48	1A	10
	46	1A	85	67	E	25	40	48	1C	10
	47	1A	86	68	E	25	3B	48	1C	11
	48	17	83	65	D	22	3B	50	1E	11
	49	17	83	65	D	22	37	50	1E	13
	4A	17	84	66	D	20	37	50	20	13
	4B	15	81	63	C	1E	37	58	22	13
	4C	15	82	64	C	1E	33	58	22	14
	4D	15	82	64	C	1C	33	58	24	14
	4E	13	80	62	B	1C	30	60	24	15
	4F	13	80	62	B	1B	30	60	26	15
	50	13	81	63	B	1B	2D	60	26	17
	51	12	7F	61	A	1A	2D	68	28	17
	52	12	7F	61	A	1A	2B	68	28	18
	53	12	80	62	A	18	2B	68	2A	18
	54	10	7E	60	9	18	28	70	2A	19
	55	10	7E	60	9	17	28	70	2C	19
2B	3F	26	92	74	15	33	4E	30	14	D
	40	21	8D	6F	12	2F	4E	38	16	D
	41	21	8D	6F	12	2F	46	38	16	F
	42	21	8E	70	12	2B	46	38	18	F
	43	1D	89	6B	10	2B	40	40	18	10
	44	1D	8A	6C	10	27	40	40	1A	10
	45	1A	87	69	E	27	3B	48	1A	11
	46	1A	87	69	E	25	3B	48	1C	11
	47	1A	88	6A	E	25	36	48	1C	13
	48	17	85	67	D	22	36	50	1E	13
	49	17	85	67	D	22	32	50	1E	14
	4A	17	86	68	D	20	32	50	20	14
	4B	15	83	65	C	1E	32	58	22	14
	4C	15	84	66	C	1E	2F	58	22	16
	4D	15	84	66	C	1C	2F	58	24	16
	4E	13	82	64	B	1C	2C	60	24	17
	4F	13	83	64	B	1B	2C	60	26	17
	50	13	83	65	B	1B	29	60	26	19
	51	12	81	63	A	1A	29	68	28	19
	52	12	81	63	A	1A	27	68	28	1A
	53	12	82	64	A	18	27	68	2A	1A
	54	10	80	62	9	18	25	70	2A	1C
	55	10	80	62	9	17	25	70	2C	1C
2C	3F	26	94	76	15	2D	4E	30	17	D
	40	21	8F	71	12	29	4E	38	19	D
	41	21	8F	71	12	29	46	38	19	F
	42	21	90	72	12	25	46	38	1B	F
	43	1D	8B	6D	10	25	40	40	1B	10
	44	1D	8C	6E	10	22	40	40	1E	10
	45	1A	89	6B	E	22	3B	48	1E	11
	46	1A	89	6B	E	20	3B	48	20	11
	47	1A	8A	6C	E	20	36	48	20	13
	48	17	87	69	D	1E	36	50	22	13
	49	17	87	69	D	1E	32	50	22	14
	4A	17	88	6A	D	1C	32	50	25	14
	4B	15	85	67	C	1A	32	58	27	14
	4C	15	86	68	C	1A	2F	58	27	16
	4D	15	86	68	C	19	2F	58	29	16
	4E	13	84	66	B	19	2C	60	29	17
	4F	13	84	66	B	18	2C	60	2B	17
	50	13	85	67	B	18	29	60	2B	19
	51	12	83	65	A	16	29	68	2E	19
	52	12	83	65	A	16	27	68	2E	1A
	53	12	84	66	A	15	27	68	30	1A
	54	10	82	64	9	15	25	70	30	1C
	55	10	82	64	9	14	25	70	32	1C
2D	3F	26	96	78	15	2D	47	30	17	E
	40	21	91	73	12	29	47	38	19	E
	41	21	91	73	12	29	40	38	19	10
	42	21	92	74	12	25	40	38	1B	10
	43	1D	8D	6F	10	25	3A	40	1B	12
	44	1D	8E	70	10	22	3A	40	1E	12
	45	1A	8B	6D	E	22	35	48	1E	13
	46	1A	8B	6D	E	20	35	48	20	13
	47	1A	8C	6E	E	20	31	48	20	15
	48	17	89	6B	D	1E	31	50	22	15
	49	17	89	6B	D	1E	2E	50	22	16
	4A	17	8A	6C	D	1C	2E	50	25	16
	4B	15	87	69	C	1A	2E	58	27	16
	4C	15	88	6A	C	1A	2B	58	27	18
	4D	15	88	6A	C	19	2B	58	29	18
	4E	13	86	68	B	19	28	60	29	1A
	4F	13	86	68	B	18	28	60	2B	1A
	50	13	87	69	B	18	26	60	2B	1B
	51	12	85	67	A	16	26	68	2E	1B
	52	12	85	67	A	16	24	68	2E	1D
	53	12	86	68	A	15	24	68	30	1D
	54	10	84	66	9	15	22	70	30	1E
	55	10	84	66	9	14	22	70	32	1E
2E	3F	26	98	7A	15	2D	40	30	17	10
	40	21	93	75	12	29	40	38	19	10
	41	21	93	75	12	29	3A	38	19	12
	42	21	94	76	12	25	3A	38	1B	12
	43	1D	8F	71	10	25	34	40	1B	14
	44	1D	90	72	10	22	34	40	1E	14
	45	1A	8D	6F	E	22	30	48	1E	15
	46	1A	8D	6F	E	20	30	48	20	15
	47	1A	8E	70	E	20	2C	48	20	17
	48	17	8B	6D	D	1E	2C	50	22	17
	49	17	8B	6D	D	1E	29	50	22	19
	4A	17	8C	6E	D	1C	29	50	25	19
	4B	15	89	6B	C	1A	29	58	27	19
	4C	15	8A	6C	C	1A	26	58	27	1B
	4D	15	8A	6C	C	19	26	58	29	1B
	4E	13	88	6A	B	19	24	60	29	1C
	4F	13	88	6A	B	18	24	60	2B	1C
	50	13	89	6B	B	18	22	60	2B	1E
	51	12	87	69	A	16	22	68	2E	1E
	52	12	87	69	A	16	20	68	2E	20
	53	12	88	6A	A	15	20	68	30	20
	54	10	86	68	9	15	1E	70	30	22
	55	10	86	68	9	14	1E	70	32	22
2F	3F	26	9A	7C	15	26	40	30	1B	10
	40	21	95	77	12	23	40	38	1D	10
	41	21	95	77	12	23	3A	38	1D	12
	42	21	96	78	12	20	3A	38	20	12
	43	1D	91	73	10	20	34	40	20	14
	44	1D	92	74	10	1E	34	40	23	14
	45	1A	8F	71	E	1E	30	48	23	15
	46	1A	8F	71	E	1B	30	48	25	15
	47	1A	90	72	E	1B	2C	48	25	17
	48	17	8D	6F	D	1A	2C	50	28	17
	49	17	8D	6F	D	1A	29	50	28	19
	4A	17	8E	70	D	18	29	50	2B	19
	4B	15	8B	6D	C	17	29	58	2D	19
	4C	15	8C	6E	C	17	26	58	2D	1B
	4D	15	8C	6E	C	15	26	58	30	1B
	4E	13	8A	6C	B	15	24	60	30	1C
	4F	13	8A	6C	B	14	24	60	33	1C
	50	13	8B	6D	B	14	22	60	33	1E
	51	12	89	6B	A	13	22	68	35	1E
	52	12	89	6B	A	13	20	68	35	20
	53	12	8A	6C	A	12	20	68	38	20
	54	10	88	6A	9	12	1E	70	38	22
	55	10	88	6A	9	11	1E	70	3B	22
30	3F	26	9C	7E	15	26	39	30	1B	12
	40	21	97	79	12	23	39	38	1D	12
	41	21	97	79	12	23	33	38	1D	14
	42	21	98	7A	12	20	33	38	20	14
	43	1D	93	75	10	20	2F	40	20	16
	44	1D	94	76	10	1E	2F	40	23	16
	45	1A	91	73	E	1E	2B	48	23	18
	46	1A	91	73	E	1B	2B	48	25	18
	47	1A	92	74	E	1B	27	48	25	1A
	48	17	8F	71	D	1A	27	50	28	1A
	49	17	8F	71	D	1A	25	50	28	1C
	4A	17	90	72	D	18	25	50	2B	1C
	4B	15	8D	6F	C	17	25	58	2D	1C
	4C	15	8E	70	C	17	22	58	2D	1E
	4D	15	8E	70	C	15	22	58	30	1E
	4E	13	8C	6E	B	15	20	60	30	20
	4F	13	8C	6E	B	14	20	60	33	20
	50	13	8D	6F	B	14	1E	60	33	22
	51	12	8B	6D	A	13	1E	68	35	22
	52	12	8B	6D	A	13	1C	68	35	24
	53	12	8C	6E	A	12	1C	68	38	24
	54	10	8A	6C	9	12	1B	70	38	26
	55	10	8A	6C	9	11	1B	70	3B	26

Table 7-9. (2)

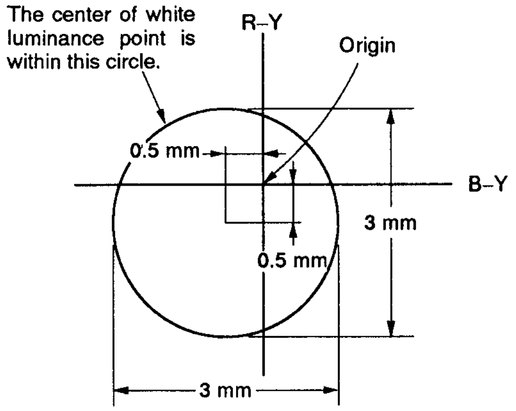
7-2-29. Outdoor White Balance Check (VC-80 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: VIDEO output terminal
Measuring Instrument	When oscilloscope used: CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Specified Value	See Fig. 7-37.

Connections:
1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array.
(Set the EVR adjustment mode to OFF.)

Checking method:
1) Cover the lens with the C14 filter for color temperature correction.
2) Press the white balance button to select the outdoor white balance mode. (☀ mark is displayed on EVF screen.)
3) Confirm that the center of the white luminance point is within the standard circle.
Note: When using a vectorscope, adjust the gain and phase of the vectorscope so that burst luminance point moves to the burst position of the color reproduction frame.

[When using vectorscope]



[When using oscilloscope]

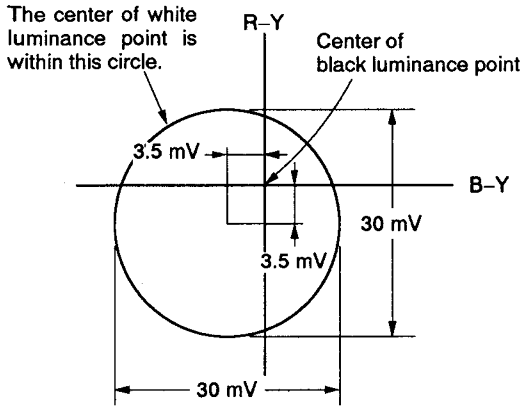

The center of white luminance point is within this circle.
R–Y
Center of black luminance point
3.5 mV
B–Y
30 mV
3.5 mV
30 mV

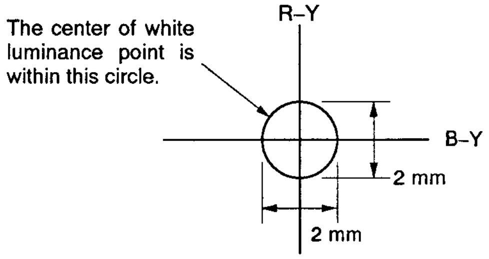
Fig. 7-37.

7-2-30. Auto White Balance Check (VC-80 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: VIDEO output terminal
Measuring Instrument	When oscilloscope used: CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Specified Value	See Fig. 7-38.

Checking method:
1) Select adjustment address 75 with the adjustment remote controller and enter adjustment data of F0. (Auto white balance tracking zone invalidity/all area discrimination mode setting)
2) Change the adjustment address to store the adjustment data in the memory.
3) Remove the jumper wire between Pin (B6) of the check point array and the ground.
(Set the EVR adjustment mode to OFF.)
4) Set the white balance to the auto white balance mode.
5) Confirm that the white luminance point matches with the origin (or the black luminance point) when shooting the white pattern without the C14 filter.
6) Cover the lens with the C14 filter and confirm that the white luminance point matches with the origin (or the black luminance point) in about 2 seconds.
7) Connect Pin (B6) of the check point array to the ground with the jumper wire.
(Set the EVR adjustment mode to ON.)
8) Select the adjustment address 75 with the adjustment remote controller and the adjustment data of 00.
(Release auto white balance check mode)
9) Change the adjustment address to store the adjustment data in the memory.

[When using vectorscope]



[When using oscilloscope]

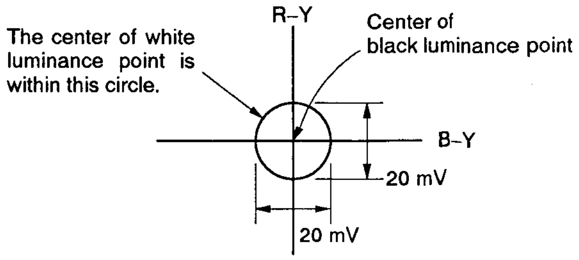

The center of white luminance point is within this circle.
R–Y
Center of black luminance point
B–Y
20 mV
20 mV

Fig. 7-38.

7-2-31. Focus Motor Speed Adjustment (VC-80 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	24 (FOCUS SPEED)
Specified Value	Average value of data indicated on jig=6.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 3 seconds after completion of adjustment.

Adjusting method:
1) Set the auto focus to ON.
2) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 01.
(Sets hunching mode)
3) Set the adjustment address to 24.
4) Change the adjustment data so that the indication on the AF microprocessor data reading jig is 06 while the ring is rotating.
5) Press the HOLD button of the AF microprocessor data reading jig while the focus ring is rotating to read the indication value.
6) Repeat step 5) ten times and obtain the average value.
Specified value=6.0 ± 0.5
Repeat steps 4) and 5) if the specified value is not satisfied.
7) Set the adjustment address to 25 and set the adjustment data to 00. (Releases hunching mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-32. Macro Area Adjustment (VC-80 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	27 (MACRO)
Specified Value	(Value at zoom ring WIDE position) -1

Adjusting method:
1) Press the WIDE side of the zoom button and set the zoom ring to the WIDE position (8.5 mm).
2) Select adjustment address 25 with the adjustment remote controller and set the adjustment data to 03. (Sets zoom position indication mode)
3) Read the data indicated on the AF microprocessor data reading jig. (Data in the range of 06 to 0E is displayed if normal.)
4) Change the adjustment address to 27.
5) Subtract 1 from the data read from the jig and enter as the adjustment data. (See Table 7-5. Hexadecimal — decimal conversion table)
6) Change the adjustment address to 25 and set the adjustment data to 00. (Releases zoom position indication mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-33. Auto Focus Adjustment (VC-80 Board)

1. Adjustment in all black pattern

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	33 (FHB), 35 (AGC B)

Adjusting method:
1) Set the auto focus to OFF with the focus button.
2) Select adjustment address 25 with the adjustment remote controller and set the adjustment data to FF.
(Set the auto focus filter to FH)
3) Read the data indicated on the AF microprocessor data reading jig (FH B) and enter adjustment address 33. (FH B will be 00 to 04.)
4) Select adjustment address 25 and set the adjustment data to FD. (Set the auto focus filter to FA position.)
5) Confirm the data indicated the AF microprocessor data reading jig (FA B) is 00 to 0C.
6) Select adjustment address 25 and set the adjustment data to 0B. (Auto focus LLA adjustment mode)
7) Read the data indicated on the AF microprocessor data reading jig (AGC B) and enter adjustment address 35.
8) Perform "Adjustment in all white pattern".

2. Adjustment in all white pattern

Subject	All white pattern[Note1]
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	32 (FHW), 34 (AGC W)

Note: Place the pattern box without chart in the front of the camera. Set the zoom lever to TELE position and shoots the pattern box.

Adjusting method:
1) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of FF.
2) Read the data (FH W) indicated on the AF microprocessor data reading jig and enter adjustment address 32. (FH W should be 00 or 01.)
3) Select adjustment address 25 and set the adjustment data to FD.
4) Confirm that the data (FA W) indicated on the AF microprocessor data reading jig is 00 to 03.
5) Select adjustment address 25 and set the adjustment data to 0B.
6) Read the data (AGC W) indicated on the AF microprocessor data reading jig and enter adjustment address 34.
7) Select adjustment address 25 and enter adjustment data of 00.
8) Change the adjustment address to store the adjustment data in the memory.

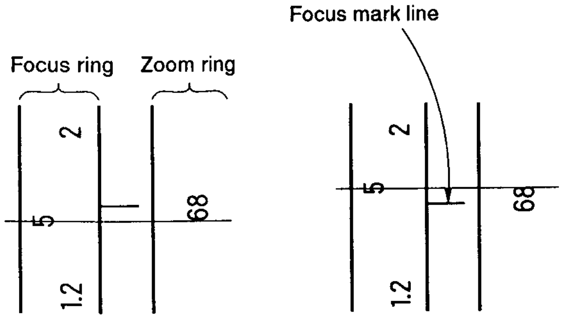
7-2-34. Auto Focus Check

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Subject	Siemens star (position 1.5 m from the front of the lens reference plane (CCD imager))

Measuring method:

1) Place the Siemens star 1.5 m from the front of the lens reference plane (See Fig. 7-2.).
2) Set the zoom lever to the TELE position (68 mm) and set the auto focus to ON with FOCUS button.
3) Adjust the position of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
4) To open the iris, decrease the illumination of the Siemens star chart to the range in which the normal image without the noise can be obtained.
(Or cover lens with the ND filter.)
5) Set the auto-focus to OFF with FOCUS button.
6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-39. at this time.
Perform "Flange Back Adjustment" if the specification is not satisfied.
7) Turn the focus ring to the close extreme (1.2 m).
8) Set the auto-focus to ON with FOCUS button.
9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
10) Set the auto-focus to OFF and turn the focus ring to the far extreme (∞).
11) Set the auto-focus to ON.
12) Confirm that there is focusing within three seconds and a sharp image can be obtained.



Specified value: The center of the character "5" of the focus ring is within the character "68" of the zoom ring.

Fig. 7-39.

7-2-35. Fader Level Adjustment

Subject	Arbitrary
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjusting Element	0F (FADER LEVEL)
Specified Value	20 ± 5 mV

Adjusting method:

1) Set adjustment data FF to adjustment address 03 (FADER) with the adjustment remote controller.
2) Change the adjustment address to 0F.
3) Change the adjustment data and set the FADER Y signal level to 20 ± 5 mV.
4) Change the adjustment address to 03 and set the adjustment data to 00.
5) Change the adjustment address to store the adjustment data in the memory.

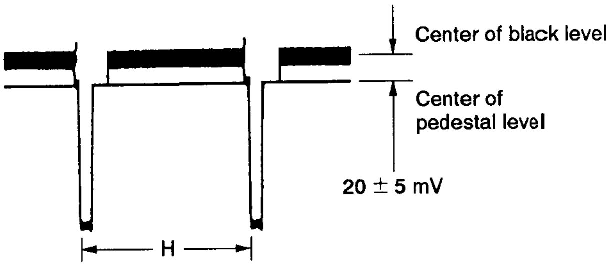


Fig. 7-40.

7-3. CAMERA REC SYSTEM ADJUSTMENTS

7-3-1. VCO Adjustment (VC-80 Board)

Subject	Arbitrary
Measurement Point	Pin ⑦ of IC141
Measuring Instrument	Digital voltmeter
Adjusting Element	CT141
Specified Value	2.8 ± 0.2 Vdc

Adjusting method:

1) Set to 2.8 ± 0.2 Vdc with CT141.

7-3-2. Chroma Input Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ① of IC503
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	420 ± 20 mVp-p

Adjusting method:

1) Adjust the burst signal level to 420 ± 20 mVp-p using RV501.

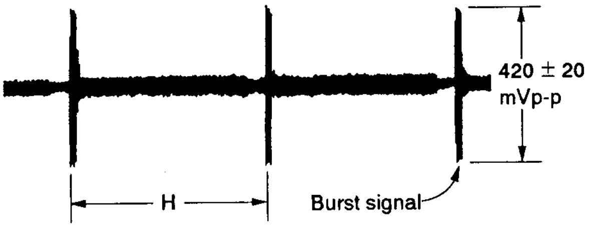

420 ± 20 mVp-p
H
Burst signal

Fig. 7-41. Chroma input level adjustment

7-3-3. Recording Chroma RF Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	Pin ① of W303 (emitter of Q504)
Measuring Instrument	Oscilloscope
Adjusting Element	RV504
Specified Value	250 ± 10 mVp-p

Adjusting method:

1) Adjust the burst signal level to 250 ± 10 mVp-p using RV504.

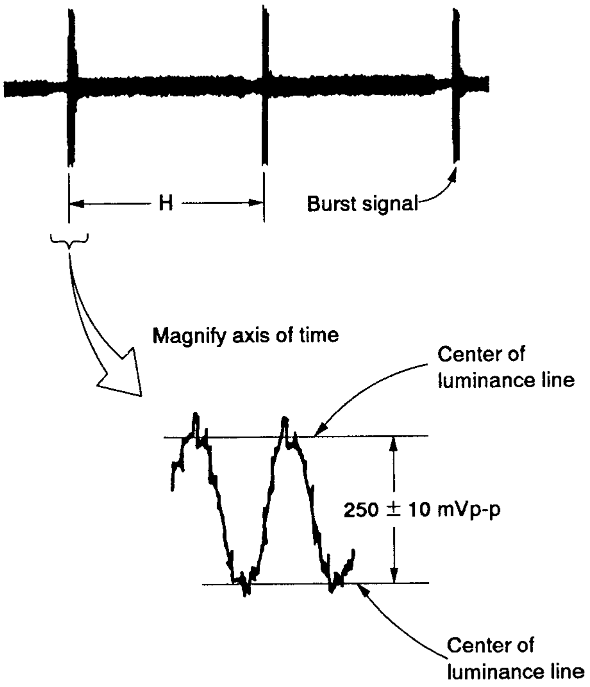

H
Burst signal
Magnify axis of time
Center of luminance line
250 ± 10 mVp-p
Center of luminance line

Fig. 7-42. Recording chroma RF level adjustment

7-3-4. Y FM Carrier Frequency Adjustment (VC-80 Board)

Subject	Arbitary
Mode	Camera recording
Measurement Point	Pin ② of W303 (emitterr of Q505)
Measuring Instrument	Frequency counter
Adjusting Element	RV502
Specified Value	4.29 ± 0.04 MHz

Connections:

1) Connect the Pin (A8) (CAM Y) of the check point array to Pin ④ (CAM 5V) of W801 with a jumper wire.

Adjusting method:

1) Adjust to 4.29 ± 0.04 MHz with RV502.
2) Be sure to perform deviation adjustment.

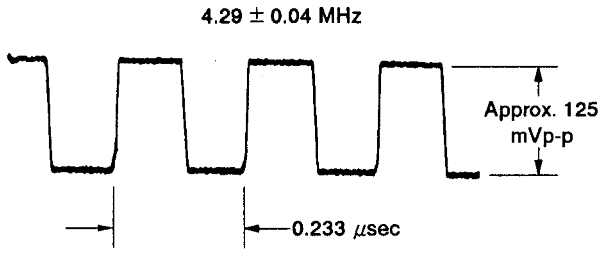


Fig. 7-43. Y FM carrier frequency adjustment

7-3-5. Y FM Deviation Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording and playback
Signal	All black signal recorded with the camera Alignment tape for operstion check (WR5-5CSP) Color bar section
Measurement Point	VIDEO output terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV503
Specified Value	(Horizontal sync signal level of alignment tape) ± 0.015V

Note: 1) Confirm that "PB Y Level 1 Adjustment", "PB Y Level 2 Adjustment" and "Y FM Carrier Frequency Adjustment" of the video block adjustment should be completed.

2) Terminate the VIDEO output terminal (J901) at 75Ω .

Adjusting method:

1) Play the color bar section of the alignment tape (WR5-5CSP) and make a note of the horizontal sync signal level (approx. 0.3V) at this time.
2) Record the all black subject with the camera.
3) Play back the tape recorded in step 2).
4) Confirm that the horizontal sync signal level at this time is the same as the level noted in step 1).
   Specified value:
   (Horizontal sync signal level of alignment tape) ± 0.015V
5) If the specified value is not satisfied, repeat 2) to 4) after turning RV503 in the following manner.

	Rotation direction of RV503
When smaller than specified value	Counterclockwise (↺)
When larger than specified value	Clockwise (↻)

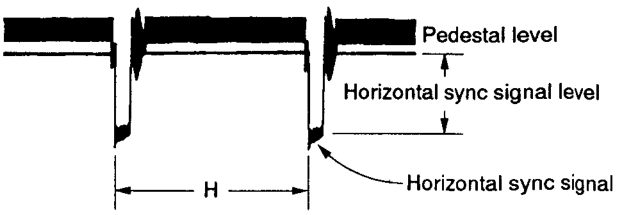


Fig. 7-44. Y FM deviation adjustment

7-3-6. REC Y Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	Pin ② of W303 (emitter of Q505)
Measuring Instrument	Oscilloscope
Adjusting Element	RV505
Specified Value	125 ± 10 mVp-p

Adjusting method:

1) Adjust RV505 to 125 ± 10 mVp-p.

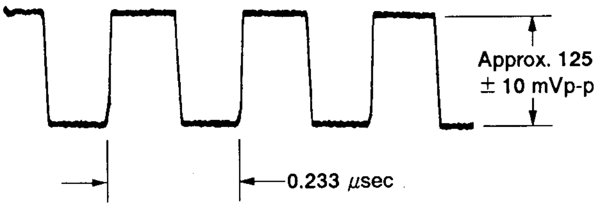


Fig. 7-45. REC Y level adjustment

7-4. DIGITAL TITLER SYSTEM ADJUSTMENTS

7-4-1. Titler PLL Adjustment (TI-30 Board)

Subject	Arbitrary
Measurement Point	Checking point of R819 and C808
Measuring Instrument	Digital voltmeter
Adjusting Element	CT801
Specified Value	2.42 ± 0.1 Vdc

Connection:

1) Connect TP801 (PLL ADJ: Pin (64) of IC803) of the check land and Pin ⑫ of CN801 (SS5V) with a jumper wire.

Adjusting method:

1) Adjust CT801 to 2.42 ± 0.1 Vdc.

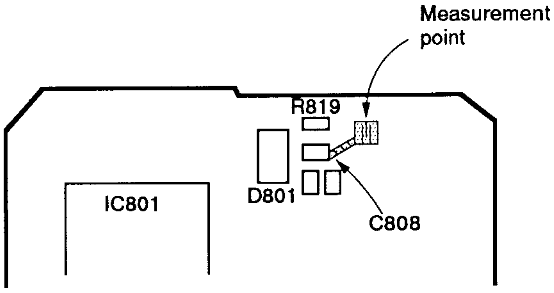


Fig. 7-46.

7-4-2. Character Generator f_0 Adjustment (TI-30 Board)

Subject	E-E
Mode	No signal
Measurement Point	Pin ⑦ of IC802
Measuring Instrument	Frequency counter
Adjusting Element	CT802
Specified Value	6.38 ± 0.05 MHz

Connection:

1) Connect Pin ⑳ of IC802 and Pin ⑫ of CN801 (SS5V) with a jumper wire.

Adjusting method:

1) Adjust CT802 to 6.38 ± 0.05 MHz.

7-4-3. Title A/D Level Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Confirmed on monitor TV
Measuring Instrument	
Adjustment Address	21 (TITLE TH)
Specified Value	See Fig. 7-47.

Note: Make sure that "Y Level Adjustment" is completed.

Adjusting method:

1) Select adjustment address 21 with the adjustment remote controller.
2) Press the MEMORY button (S762 on CF-1 board).
3) Confirm that magenta, red, blue and black portions are superimposed and become white, and confirm that green portion is not changed.
4) If this condition is not satisfied, change the adjustment data with the adjustment remote controller and repeat steps 2) and 3).
5) Change the adjustment address to store the adjustment data in the memory.

The shaded portion should be turned to white.

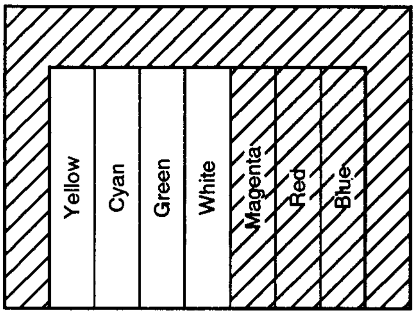


Fig. 7-47.

7-4-4. Title Y Level Adjustment (VC-80 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	0A (TITLE Y)
Specified Value	570 ± 80 mV

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjusting method:

1) Cover the lens with the black cap and press the MEMORY button (S657 on CF-1 board).
2) Confirm that "WHITE" characters are displayed in the EVF.
3) Select adjustment address 0A with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 570 ± 80 mV.
5) Change the adjustment address to store the adjustment data in the memory.

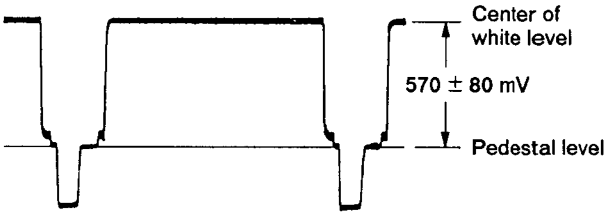


Fig. 7-48.

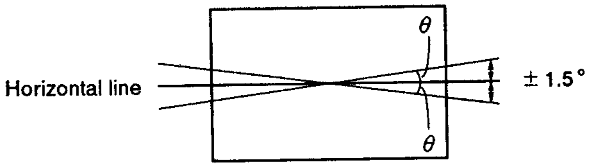
7-5. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS

7-5-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-49.

Adjusting method:

1) Adjust optimum brightness on the CRT with RV954 (BRIGHT).
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the picture horizontal by rotating DY.
4) Retighten the DY tightening nut.
   (Do not tighten excessively.)


θ
Horizontal line
± 1.5°
θ

Specified value: Image orientation to be within ± 1.5° of horizontal line.

Fig. 7-49.

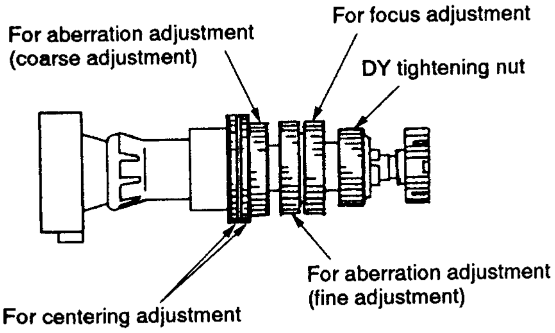

For aberration adjustment (coarse adjustment)
For focus adjustment
DY tightening nut
For aberration adjustment (fine adjustment)
For centering adjustment

Fig. 7-50.

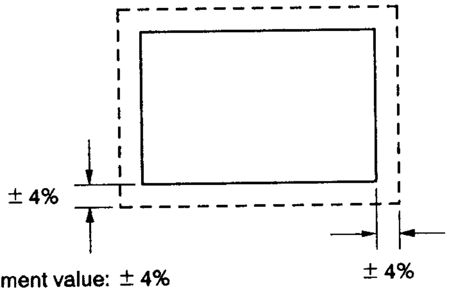
7-5-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-51.

Adjusting method:

1) Turn the centering adjustment rings to make the margin even at right, left, upper and lower of the screen.
   (See Fig. 7-50.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation that exhibits median displacements of the image.



Adjustment value: ± 4%

Fig. 7-51.

7-5-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion

Adjusting method:

1) Adjust for optimum focus using the focus ring.
   (See Fig. 7-50.)

7-5-4. Aberration Adjustment

Mode	E–E
Signal	Dot pattern
Specified Value	See Fig. 7-52.

Adjusting method:

1) Use the aberration adjustment rings to adjust any trailing dots to under 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the "Centering Adjustment".

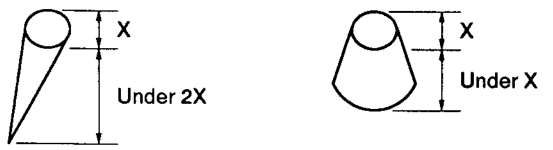


Fig. 7-52.

7-5-5. Horizontal Oscillation Frequency Adjustment (VF-40 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Positive terminal of C954
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjusting Element	RV951
Specified Value	2.60 ± 0.05 Vdc

Adjusting method:

1) Adjust RV951 to 2.60 ± 0.05 Vdc.

7-5-6. Horizontal Amplitude Adjustment (VF-40 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion
Adjusting Element	C961
Specified Value	6 ± 2%

Adjusting method:

1) By turning RV952, align upper and lower edges of the monoscope image with those of the screen.
2) By turning RV954, attain a normal brightness level.
3) To achieve 6 ± 2% horizontal overscans (right and left total), short-circuit or open the pattern (A) for H size adjusting capacitor (C961). (See Fig. 7-54.)

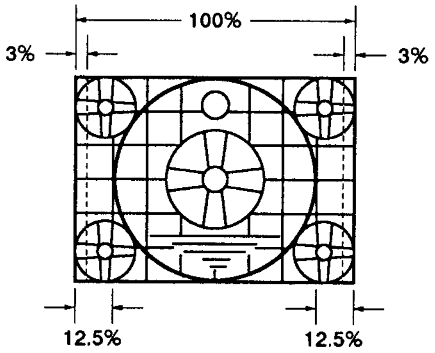
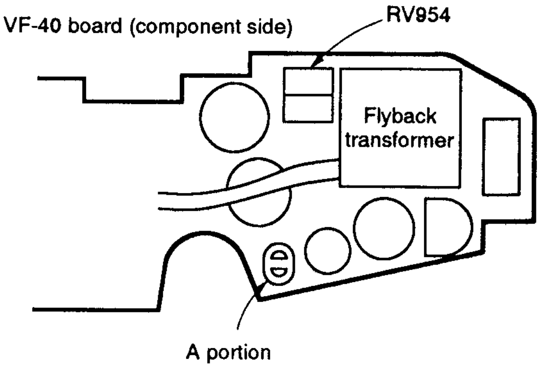


Fig. 7-53.



A section	H size
Open	Small
Short	Large

Fig. 7-54.

7-5-7. Vertical Amplitude Adjustment (VF-40 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion
Adjusting Element	RV952
Specified Value	5 ± 2%

Adjusting method:

1) By turning RV952, adjust for 5 ± 2% (upper and lower total) vertical overscan.

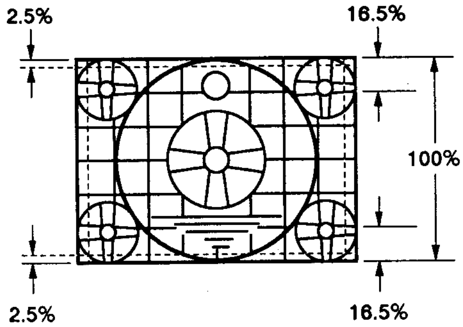


Fig. 7-55.

7-5-8. Brightness, Contrast Adjustments (VF-40 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Monoscope portion
Adjusting Element	Brightness: RV954 Contrast: RV953

Adjusting method:

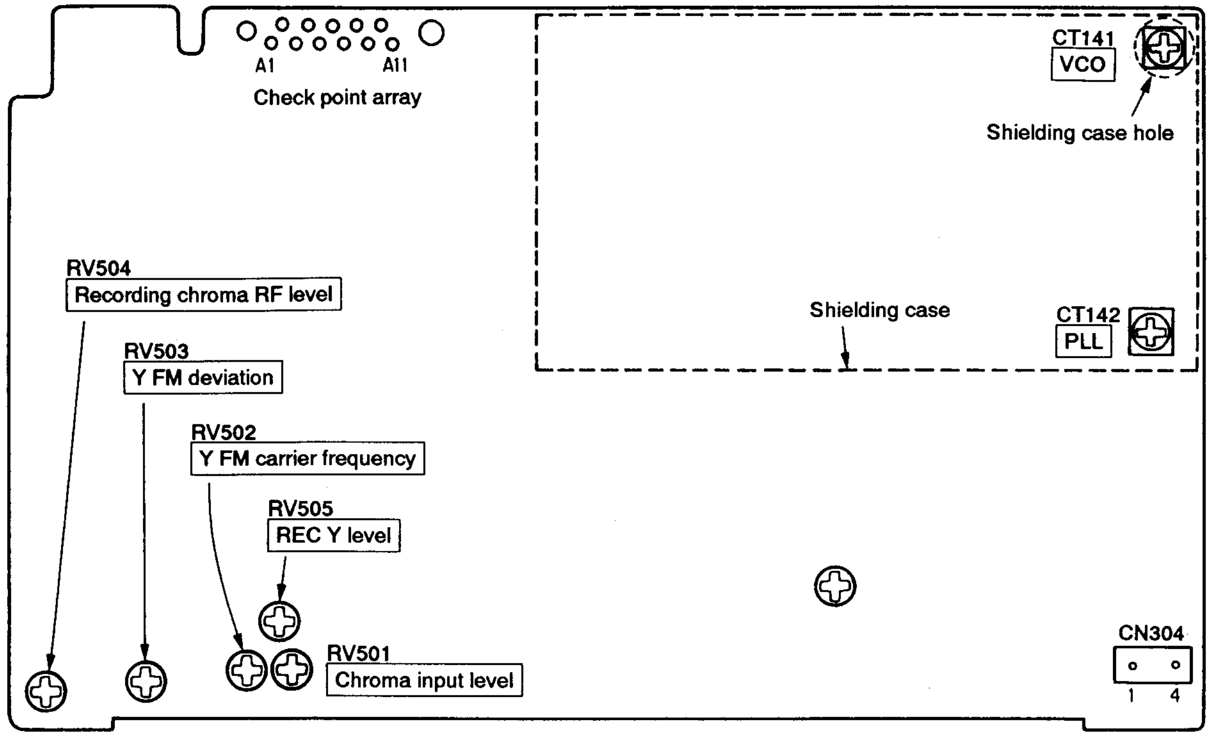
1) Turn RV954 and RV953 alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-5-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

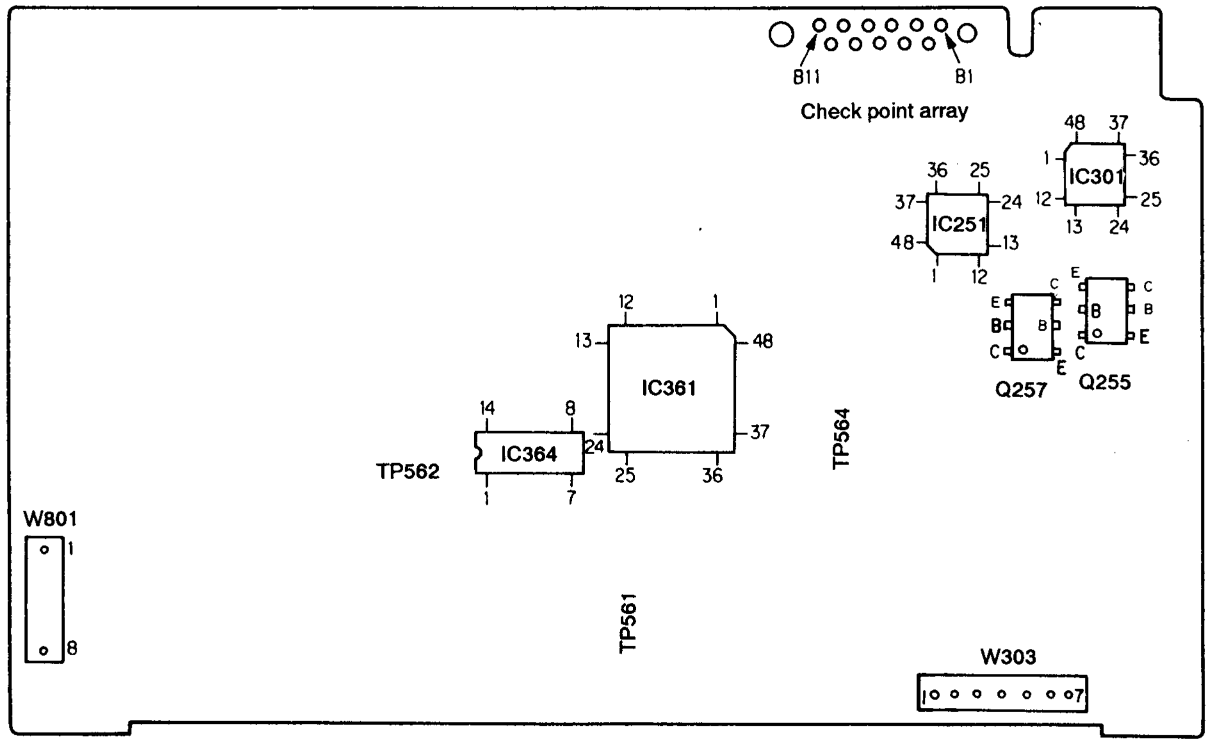
Values should conform to specifications given in "7-5-6. Horizontal Amplitude Adjustment" and "7-5-7. Vertical Amplitude Adjustment". If not, readjust accordingly, and repeat "7-5-8. Brightness, Contrast Adjustments". In this case, focus needs to be checked. If the image is not clear, perform "7-5-3. Focus Adjustment" and "7-5-4. Aberration Adjustment".

7-6. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

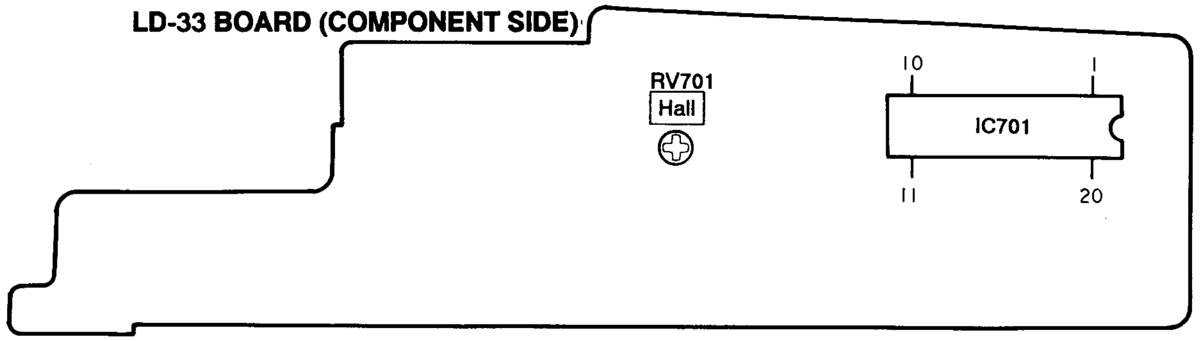
VC-80 BOARD (COMPONENT SIDE)
(Also illustrated on page 294.)


A1
A11
Check point array
CT141
VCO
Shielding case hole
Shielding case
CT142
PLL
RV504
Recording chroma RF level
RV503
Y FM deviation
RV502
Y FM carrier frequency
RV505
REC Y level
RV501
Chroma input level
CN304
1
4

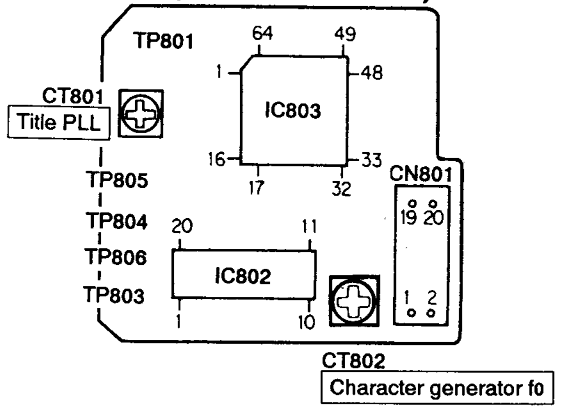
VC-80 BOARD (CONDUCTOR SIDE)
(Also illustrated on page 294.)


B11
B1
Check point array
IC301
IC251
IC361
IC364
Q257
Q255
TP562
TP564
TP561
W801
W303

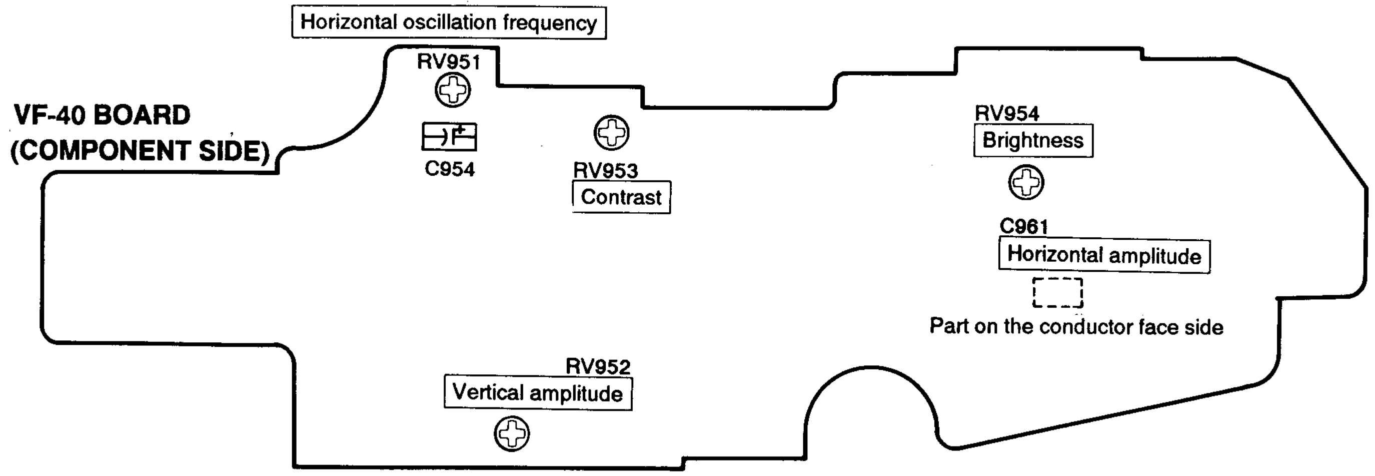
LD-33 BOARD (COMPONENT SIDE)


RV701
Hall
IC701
10
1
11
20

TI-30 BOARD (COMPONENT SIDE)


TP801
CT801
Title PLL
IC803
TP805
TP804
TP806
TP803
IC802
CN801
CT802
Character generator f0

VF-40 BOARD (COMPONENT SIDE)


Horizontal oscillation frequency
RV951
C954
RV953
Contrast
RV954
Brightness
C961
Horizontal amplitude
Part on the conductor face side
RV952
Vertical amplitude

SECTION 8
MECHANICAL ADJUSTMENT

MECHANICAL ADJUSTMENT

As to the mechanical adjustment and check and parts replacement, refer to the separate "8 mm Video Mechanical Adjustment Manual II FL mechanism (Q mechanism) ". However, follow these items shown below.

The adjustment and the marks remain the same except this model has the different drum installed.

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

8-1. OPERATING WITH THE CASSETTE COMPARTMENT ASSEMBLY REMOVED (See Fig. 8-1.)

1. Loading

1) Remove the cabinets and camera block according to the "section 2. DISASSEMBLY", and supply the power to the unit. (Set up the mechanism deck so as to operate.)
2) Push into the lock plate release arm ❶ in the direction of arrow, causing the unit to be the loading state.

2. Putting into the playback state

1) Short circuit Pins ③ and ⑧ of CN204 on the VS-67 board to set to the TEST mode.
   (In the TEST mode, the rotation detecting, etc. of the S and T reel tables is ceased. This enables the tape traveling.)
2) After completing the step 1), set the power switch to VTR.
3) Put the cap ❸ on the LED assembly ❷.
4) Push into the lock plate release arm ❶ to load.
5) Press the playback button.

3. Putting into the recording state

1) Perform the step 1) through 4) of 2. Putting into the playback state.
2) Secure the push switch ❹ with an adhesive tape ❺.
3) Turn on the REC switch.

4. Ejecting

1) Push the EJECT button.

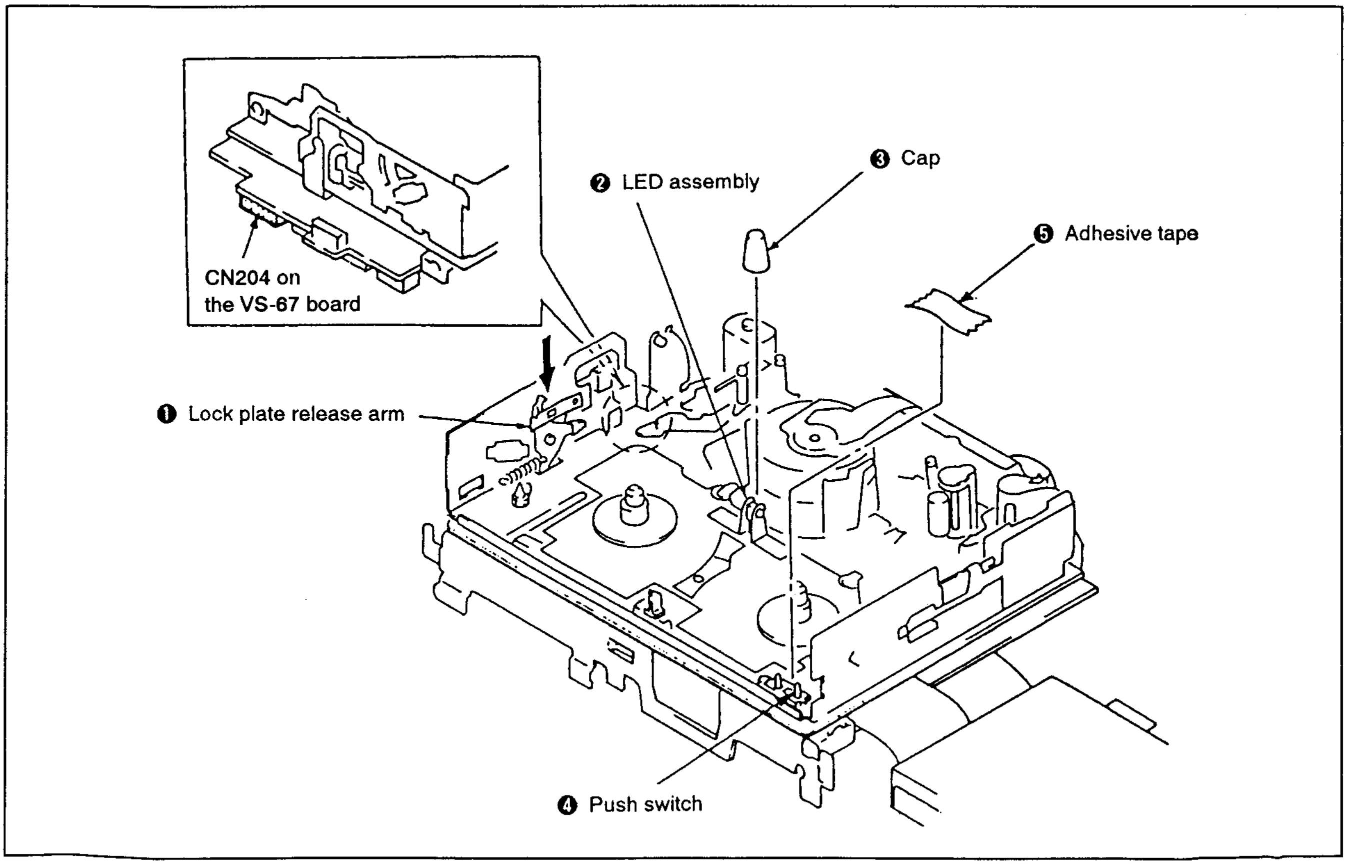


Fig. 8-1.

8-2. TAPE PATH ADJUSTMENT

1. Preparations

1) Clean the tape pass surface (tape guide, drum, capstan shaft and pinch roller).
2) Short circuit Pins ③ and ⑦ of CN204 on the VS-67 board to set to the PATH mode.
3) Connect to an oscilloscope.
   Channel 1 — Pin ① of CN204 on the VS-67 board
   External trigger — Pin ④ of CN204 on the VS-67 board
4) Play back the tracking alignment tape (WR5-1N).
5) Confirm that the RF waveforms at both sides of the entrance and exit on the oscilloscope are flat.
   If not, perform adjustment according to the following.

CN204 on the VS-67 board

1	PB RF CH1
2	PB RF CH2
3	PB RF GND
4	RF SWP
5	UN (1/2 RF SWP)
6	UN (REC C CHECK)
7	UN (PATH)
8	UN (TEST)
9	UN (CAM ADJ)
10	UN (SP)/LP
11	DRUM I COM
12	CAP FG

SECTION 9

VIDEO BLOCK ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 294.

9-1. PRE-ADJUSTMENT PREPARATIONS (VIDEO BLOCK)

Use the following measuring instruments for adjustment of the VTR block.

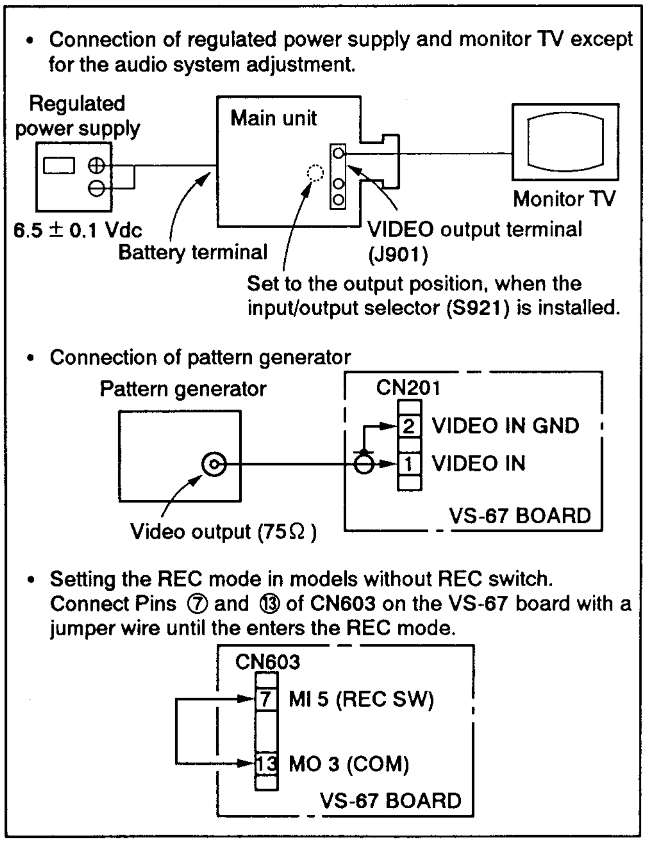
9-1-1. Equipment to be Used

1) Monitor TV
2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    Tracking adjustment (WR5-1CP)*1
        Parts Code: 8-967-995-07
    Video frequency characteristics adjustment (WR5-6C)*2
        Parts Code: 8-967-995-17
    Operation check (WR5-4CL)*3
        Parts Code: 8-967-995-56
    Operation check (WR5-5CSP)*4
        Parts Code: 8-967-995-47
    AFM stereo operation check (WR-9NS)
        Parts Code:
    Note:
        *1 WR5-1C (8-967-995-06) is also available.
        *2 WR5-2C (8-967-995-16) is also available.
        *3 WR5-3CL (8-967-995-36) is also available.
        *4 WR5-3CSP (8-967-995-27) and WR5-4CSP (8-967-995-46) are also available.
12) Adjustment remote controller (J-6082-053-A)

9-1-2. Connection of Equipment

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the Fig. 9-1. below.

- Camera/video power switch ······· VTR (PLAYER) position
- Connect the adjustment remote controller to the remote terminal (J902 on the EL-10 board) when performing battery down adjustment.
- The mic board (MA-65 board) is not required for adjustments. Remove the following connector:
  CN402 (5-pin) on the MA-65 board
- When the camera block hinders adjustments, remove the following connectors to separate:
  CN202 (7-pin) on the VS-67 board
  CN802 (16-pin) on the VC-80 board
  CN3 (8-pin) on the DC-DC converter (DD-30 board)
- When the EVF and cabinet (R) hinders adjustments, remove the following connector:
  CN205 (4-pin) on the VS-67 board



- Connection of regulated power supply and monitor TV except for the audio system adjustment.

Regulated power supply
Main unit
Monitor TV
6.5 ± 0.1 Vdc
Battery terminal
VIDEO output terminal (J901)
Set to the output position, when the input/output selector (S921) is installed.

- Connection of pattern generator

Pattern generator
CN201
2 VIDEO IN GND
1 VIDEO IN
VS-67 BOARD
Video output (75Ω)

- Setting the REC mode in models without REC switch. Connect Pins ⑦ and ⑬ of CN603 on the VS-67 board with a jumper wire until the enters the REC mode.

CN603
7 MI 5 (REC SW)
13 MO 3 (COM)
VS-67 BOARD

Fig. 9-1.

9-1-3. Set-up During Adjustment

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VTR block electrical adjustment, it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to Pin ① of CN201 on the VS-67 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30 : 0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 9-2.

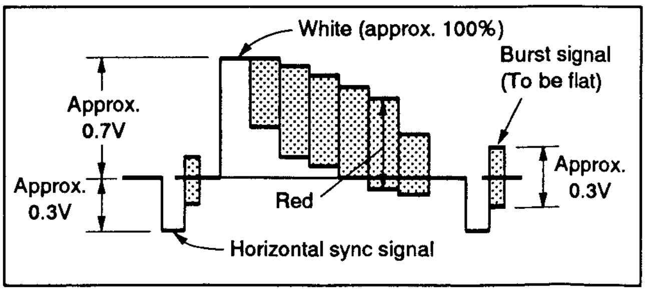

White (approx. 100%)
Burst signal (To be flat)
Approx. 0.7V
Approx. 0.3V
Approx. 0.3V
Red
Horizontal sync signal

Fig. 9-2. Color bar signal of pattern generator

9-1-4. Alignment Tapes

The following alignment tapes are available.
Use the tape indicated in the signal column; however, in case there is no type indication in the signal column, use any tape for operation check.

Tape	REC mode	Type	Tape speed	Contents		Use
				Video area	**PCM area**	
Tracking WR5-1CP or WR5-1C	L	MP	LP	CH2: 1 MHz tape path adjustment signal		Tape path adjustment
Video freq. characteristics WR5-6C	L	MP	SP	RF sweep: 0 to 10 MHz Marker: 1, 3.58, 5.5, 7MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5CSP or WR5-4CSP	L	MP	SP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation	• Audio signal (PCM) Monoscope: 20 Hz 20sec, 400 Hz 20sec, 14 kHz 20sec } Repeat four times. Color bar: 1 kHz 4 min.	Operation check
Operation check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation		
AFM stereo operation check WR-9NS	L	MP	SP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) Stereo section (color bar) L ch: 400 Hz, R ch: 1kHz (L+R: 1.5 MHz, ± 60 kHz DEV L–R: 1.7 MHz, ± 30 kHz DEV) Bilingual section (monoscope) L ch: 400 Hz (1.5 MHz, ± 60 kHz DEV) R ch: 1 kHz (1.7 MHz, ± 30 kHz DEV)	• Audio signal (PCM) Monoscope: 20 Hz 20 sec, 400 Hz 20 sec, 14 kHz 20 sec } Repeat four times. Color bar: 1 kHz 4 min.	AFM stereo operation check

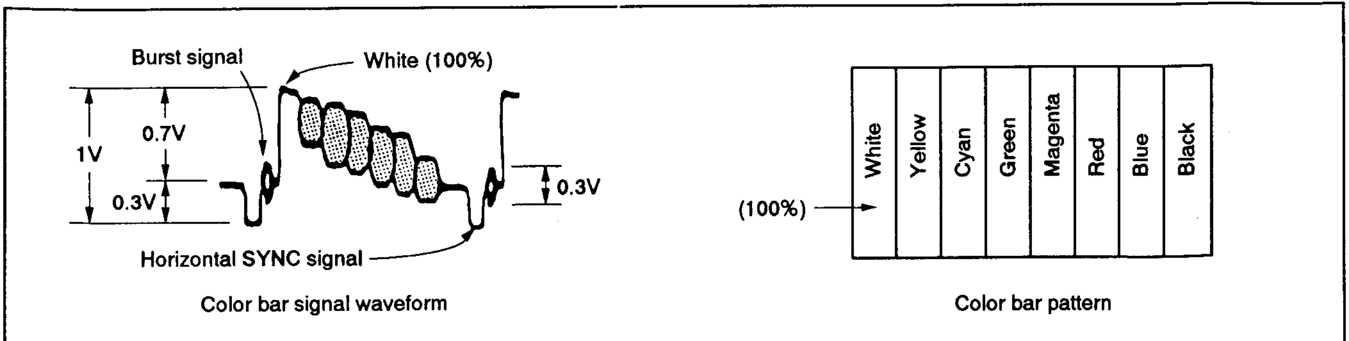
Note: Recording mode
L ········· Conventional mode
E ········· Hi8 (high band) mode

Tape type
MP ········ Particle type metal tape
ME ········ Evaporated type metal tape

Table 9-1.

75% color bar signal recorded on an alignment tape is shown in Fig. 9-3.

Note: Measured at VIDEO output terminal. (75Ω termination)



Color bar signal waveform

Color bar pattern

Fig. 9-3. Alignment tape color bar signal

9-1-5. I/O Level and Impedance

1. E, Australian model

[I/O level and impedance]

Video input/output phone jack

Input signal: 1 Vp-p, 75Ω unbalanced, negative sync

Audio input/output phone jack

Input level: –7.5 dBs (0 dBs=0.775 Vrms)

Input impedance: More than 47 kΩ

Output level: –7.5 dBs (at output impedance 47kΩ)

Output impedance: More than 2.2 kΩ

2. AEP, UK model

[Output level and impedance]

Video output phone jack

Output signal: 1 Vp-p, 75Ω unbalanced, negative sync

Audio output phone jack

Specified output: –7.5 dBs

Output impedance: More than 2.2 kΩ

9-1-6. Service Modes

This unit is equipped with service modes for adjustment and operation checking.

There are the following two service modes and switching between them is made by connection between GND and Pin (B6) of the check point array CPA001 on the VC-80 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to "Camera Block Adjustment" for details on the EVR adjustment mode.

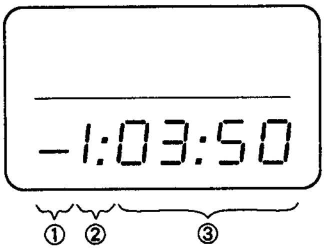
1. Invoking service mode

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-10 board) of the main unit.
2) Set HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connect between Pin (B6) of the check point array CPA001 and GND with a jumper wire.

2. Indication on adjustment remote controller LCD in the status indication mode

Note: In categories 1 through 5, the same information is displayed on the EVF screen.



①......Minus segment flashes to indicate that the service mode has been invoked.

②......Indicates service mode category.

③......Indicates battery voltage, LAST EMG, PRESET EMG, MODE SW CODE, or DEW MODE according to current category.

3. Category selection and indication in each category

Select the desired category with FF button of the adjustment remote controller. There are five categories (1 through 5) and the indications are different for each. (Note that the category 0 is the EVR adjustment mode.)

<table>
<tr><th>Caategory</th><th>Indication on LCD</th></tr>
<tr><td>1</td><td>A/D conversion value for battery voltage (decimal indication)^{Note 1}
00 : 00 – 02 : 55</td></tr>
<tr><td>2</td><td>LAST EMG (last emergency)^{Note 2}
Refer to Service Mode Error Indications.</td></tr>
<tr><td>3</td><td>PRESENT EMG (current emergency)^{Note 3}
Refer to Service Mode Error Indications.</td></tr>
<tr><td>4</td><td>MODE SW CODE (mechanism status)
<table>
<tr><td>00 : 01</td><td>READY</td></tr>
<tr><td>00 : 02</td><td>GL</td></tr>
<tr><td>00 : 03</td><td>USE</td></tr>
<tr><td>00 : 04</td><td>EJECT</td></tr>
<tr><td>00 : 05</td><td>RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)</td></tr>
<tr><td>00 : 06</td><td>LS</td></tr>
<tr><td>00 : 07</td><td>BL</td></tr>
</table></td></tr>
<tr><td>5</td><td>DEW MODE
<table>
<tr><td>00:00</td><td>NORMAL</td></tr>
<tr><td>00:01</td><td>SENSOR ON DEW MODE
(sensor in DEW mode)</td></tr>
<tr><td>00:02</td><td>SENSOR OFF DEW MODE
(Restart of operation is possible after the following conditions have been satisfied:
1. EJECT
2. More than 1H has elapsed.)</td></tr>
</table></td></tr>
</table>

Note: 1) Indicates a value proportional to the battery voltage.

2) LAST EMG indicates the error occurred just last before entering the service mode. Even if an error occurs in the service mode, it is not indicated.

3) PRESENT EMG indicates the status when FF button of the adjustment remote controller was pressed. So, the indication does not change even if the error is eliminated.

- **Service mode error indication**

Error Status	PRESENT EMG Indication	LAST EMG Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM FG error (0) when starting drum	00 : 05	00 : 05
DRUM FG error (1) when starting drum	01 : 05	00 : 14
DRUM FG error (2) when starting drum	02 : 06	00 : 15
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14
No DRUM PG (2) when starting drum	02 : 06	00 : 15
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14
DRUM FG error (2) when drum stationary		00 : 15
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14
No DRUM PG (2) when drum stationary		00 : 15
Phase error (0) when drum stationary	00 : 09	00 : 09

(1) During tape threading
(2) During tape unthreading
(0) Others

4. Releasing the service mode

The service mode can be released by returning HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

9-2. POWER SUPPLY BLOCK CHECKS

9-2-1. Power Supply Check (VS-67 Board)

Mode	Power ON
Measuring Instrument	Digital voltmeter
VIDEO 5V	
Measurement Point	Pin ② of W605
Specified Value	4.92 ± 0.04V
REG 5V	
Measurement Point	Pin ③ of W605
Specified Value	4.91 ± 0.04V
EVF 5V	
Measurement Point	Pin ① of W605
Specified Value	4.96 ± 0.03V
MOTOR 5.1V	
Measurement Point	Pin ⑩ of CN602
Specified Value	5.1 ± 0.3V

Checking method:

1) Each power supply voltage should meet the corresponding specified value.

9-3. SYSTEM CONTROL ADJUSTMENTS

9-3-1. Battery Down Adjustment (DD-30 Board)

Mode	CAMERA recording
Signal	Arbitrary
Measurement Point	Check on LCD of adjustment remote controller
Measuring Instrument	
Adjusting Element	RV101
Specified Value	"–1:01:46"

Connections:

1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-4.
2) Connect Pins ⑧ (UN (TEST)) and ③ (PB RF GND) of CN204 on the VS-67 board with a jumper wire. (TEST mode)

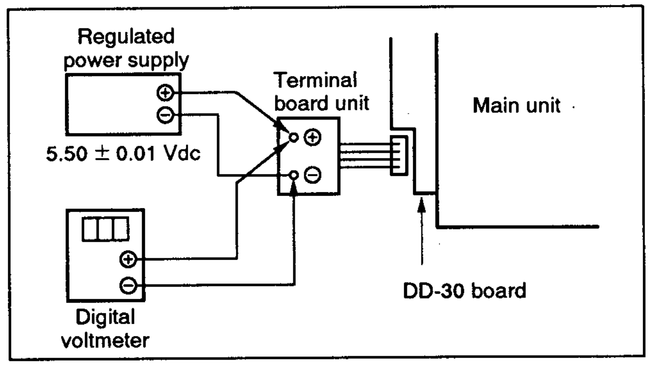


Fig. 9-4.

Adjusting method:

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-10 board).
2) Set the power supply switch (S901) on the FK-1 board to CAMERA position to select the camera recording mode.
3) Set HOLD switch of the adjustment remote controller to the HOLD position (service position).
4) Confirm that the indication of the digital voltmeter is 5.50 ± 0.01 Vdc.
5) Set the LCD counter indication on the adjustment remote controller to "–1:01:46" using RV101 on the DD-30 board. (refer to Fig. 9-6.)

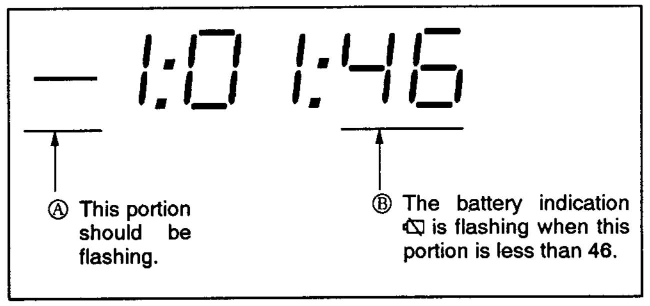

–1:01:46
Ⓐ This portion should be flashing.
Ⓑ The battery indication 🔋 is flashing when this portion is less than 46.

Fig. 9-5.

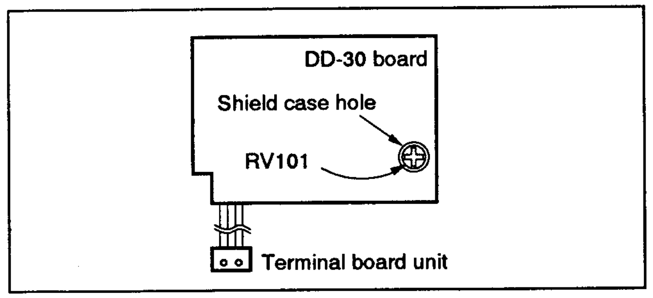


Fig. 9-6.

Checking method:

Remove connection 2) and check the following points. If the required conditions are not obtained, repeat the adjustments again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.65 ± 0.01 Vdc. (VTR in camera recording mode)
2) Confirm that the 🔋 mark is not lit on the EVF (viewfinder) screen (TALLY lamp is lit).
3) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.53 ± 0.01 Vdc.
4) Confirm that the 🔋 mark and the TALLY lamp are flashing in approx. 1 sec intervals on the EVF screen.
5) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.47 ± 0.01 Vdc.
6) Confirm that the flashing of the 🔋 mark and the TALLY lamp on the EVF screen becomes faster, and that the VTR stops and the power is turned off.

9-3-2. System Clock Adjustment (VC-80 Board)

Note: Perform the adjustment without the lens.

Mode	Power ON
Measurement Point	Pin (59) of IC561 or TP562 of check land
Measuring Instrument	Frequency counter
Adjusting Element	RV561
Specified Value	330 ± 5 kHz

Adjusting method:

1) Adjust RV561 for 330 ± 5 kHz.

9-4. SERVO SYSTEM ADJUSTMENTS

9-4-1. Capstan FG Frequency Check (VS-67 Board)

Mode	Recording (SP/LP)
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Frequency counter
Specified Value	SP mode: 1145.5 ± 2 Hz LP mode: 574.7 ± 2 Hz

Checking method:

1) Connect Pin ⑧ (UN (TEST)) and Pin ③ (PB RF GND) of CN204 with a jumper wire. (TEST mode)
2) Connect Pin ⑩ of CN204 to ground with a jumper wire or set the EDIT switch ON position. (Setting of LP mode)
3) Set to the recording mode and confirm that the capstan FG frequency is 574.7 ± 2 Hz.
4) Set to the stop mode and remove the jumper wire between Pin ⑩ of CN204 and GND or set the EDIT switch OFF position. (Setting of SP mode)
5) Set to the recording mode and confirm that the capstan FG frequency is 1145.5 ± 2 Hz.
6) Remove the jumper wire connected in step 1).

9-4-2. Capstan FG Offset Adjustment (VS-67 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	50 ± 1% duty cycle

Adjusting method:

1) Adjust RV502 so that the CAP FG output waveform duty cycle becomes 50 ± 1%.

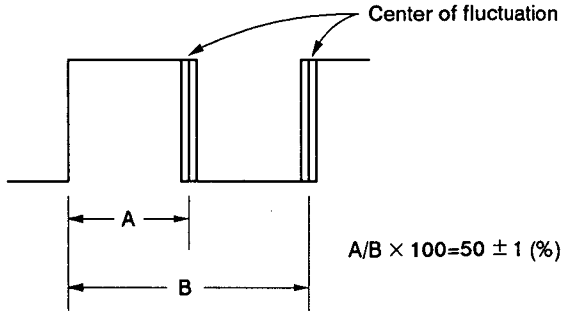


Fig. 9-7. Capstan FG offset adjustment

9-4-3. Drum Phase Lock Check (VS-67 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	CH-1: Pin ⑪ (SYSTEM SYNC) of IC601 CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Specified Value	224 ± 50 µsec

Checking method:

1) Confirm that duration between the switching point of CH-2 (RF SWP) and the rising edge of CH-1 (SYSTEM SYNC) is 224 ± 50 µsec.

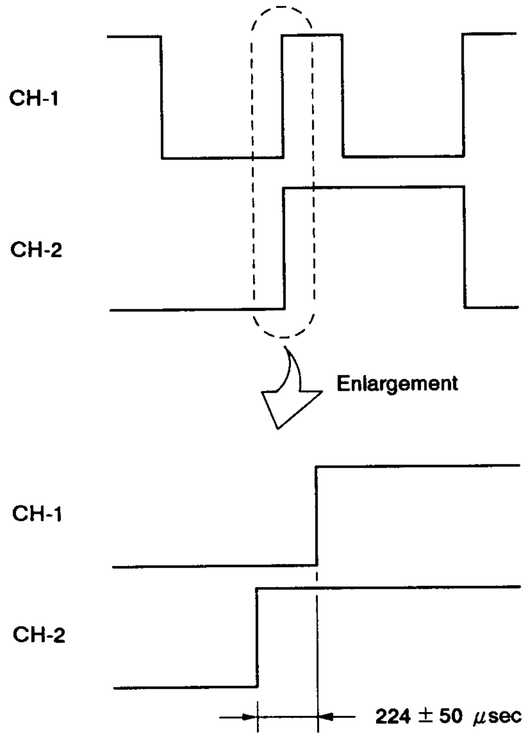


Fig. 9-8. Drum phase lock check

9-4-4. Switching Position Adjustment (VS-67 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	CH-1: VIDEO output terminal CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	6.5 ± 0.3H (410 ± 20 µsec)

Connections:

1) Connect Pin ⑧ (UN(TEST)) and Pin ③ (PB RF GND) of CN204 using a jumper wire. (TEST mode)
2) In case the cabinet (R) is connected, set EDIT switch in OFF position. (Setting of SP mode)

Adjustment method:

1) Adjust to 6.5 ± 0.3H (410 ± 20 µsec) using RV602.

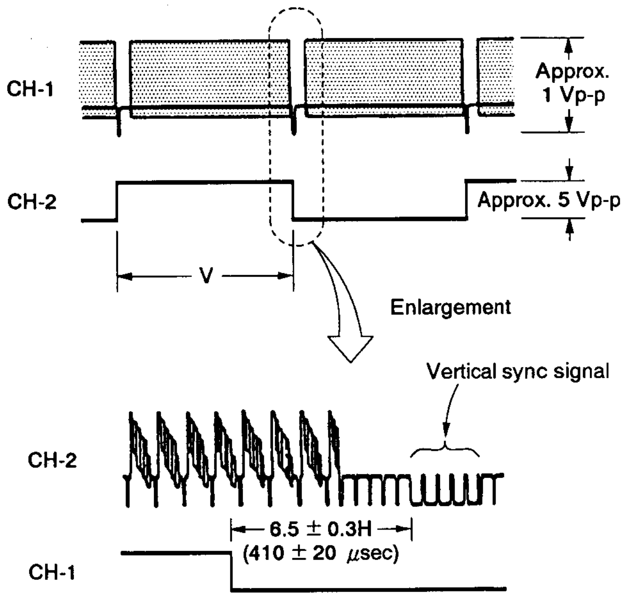


Fig. 9-9. Switching position adjustment

9-5. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure outlined below.
The color video signal supplied from the pattern generator is utilized as the video input signal for video system adjustment in the recording mode. Make sure that the sync signal and color burst signal match the specifications given in set-up for adjustment, as shown in Fig. 9-2.

[Adjustment procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C separation adjustment
5) IR2 adjustment
6) SYNC AGC adjustment
7) Emphasis input level adjustment
8) PB Y level 1 adjustment
9) PB Y level 2 adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC C RF level adjustment
14) REC Y level adjustment
15) REC C current adjustment
16) REC ATF current adjustment
17) Feedback chroma adjustment
18) Quasi burst phase adjustment
19) Delay burst phase adjustment

9-5-1. Playback Frequency Characteristics Adjustment (VS-67 Board)

Mode	Playback
Signal	Alignment tape for frequency characteristics adjustment (WR5-6C)
Measurement Point	See Fig. 9-10.
Measuring Instrument	Oscilloscope
Adjusting Element	RV111 (1a) RV113 (1b) RV112 (2a) RV114 (2b)
Specified Value	3.58 MHz level : 5.5 MHz level= 4:(3 ± 0.3)

Adjustment method:

1) Adjust each RV so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4:(3 ± 0.3) for 1a, 1b, 2a, and 2b respectively.

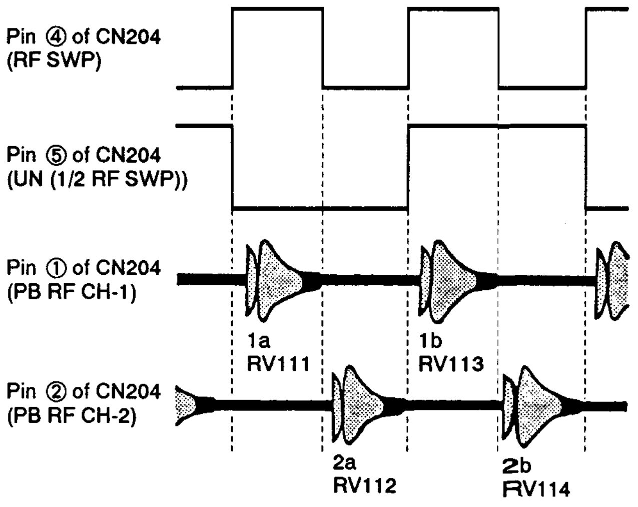


Fig. 9-10. Playback frequency characteristics adjustment

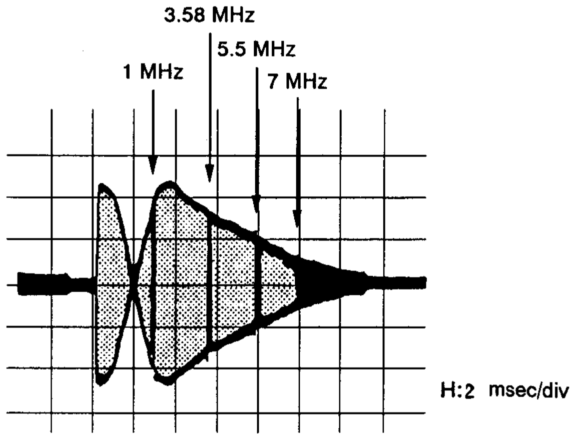


Fig. 9-11. Playback frequency characteristics adjustment

9-5-2. Flying Erase Check (VS-67 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑮ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Over 7.0 MHz Voltage: Over 7.0 Vp-p

Note: Be sure to use MP type tape.
(Pin ⑫ of CN602 should be "L".)

Checking method:

1) Confirm that the oscillation frequency is over 7.0 MHz and the oscillation voltage is over 7.0 Vp-p.

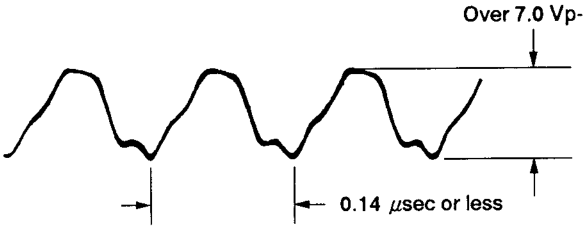


Fig. 9-12. Flying erase check

9-5-3. Crystal Oscillator fo Checking (VS-67 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Pin ⑯ of IC203
Measuring Instrument	Frequency counter
Specified Value	4433618 ± 100 Hz

Note: Connect the frequency counter through a buffer having high impedance (approx. 10 MΩ) and low capacitance (less than 10 pF).

Checking method:

1) Confirm that the oscillation frequency at Pin ⑯ of IC203 is 4433618 ± 100 Hz.

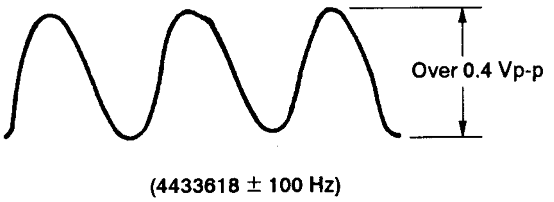


Fig. 9-13. Crystal oscillator fo adjustment

9-5-4. Y/C Separation Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV203 (DEV) (Pin ㉕ of IC203)
Measuring Instrument	Oscilloscope
Adjustment Element	RV207
Specified Value	Minimum residual chroma component

Connections:

1) Connect Pin ㊴ of IC203 (Pin ⑭ of IC202) to GND with a 10 µF/16V electrolytic capacitor.
(Capacitor negative side to GND)

Adjustment method:

1) Set the residual chroma component to minimum with RV207.

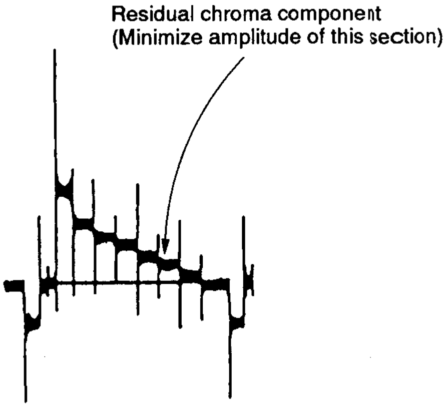

Residual chroma component
(Minimize amplitude of this section)

Fig. 9-14. Y/C separation adjustment

9-5-5. IR2 Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Pin ⑧ of IC203 or base of Q229 (BF OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV206
Specified Value	7.0 ± 0.2 μsec

Adjustment method:

1) Adjust RV206 so that it becomes 7.0 ± 0.2 μsec.

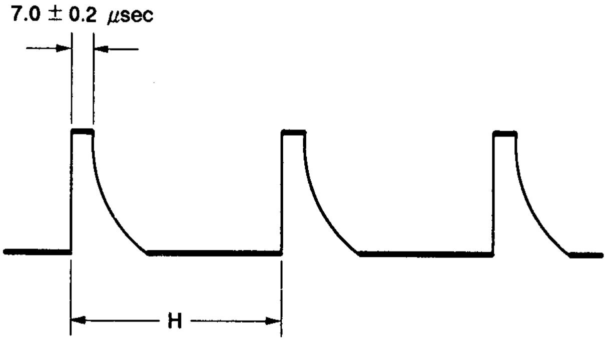


Fig. 9-15. IR2 adjustment

9-5-6. SYNC AGC Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊾ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV201
Specified Value	0.49 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV201 so that it becomes 0.49 ± 0.025 Vp-p.

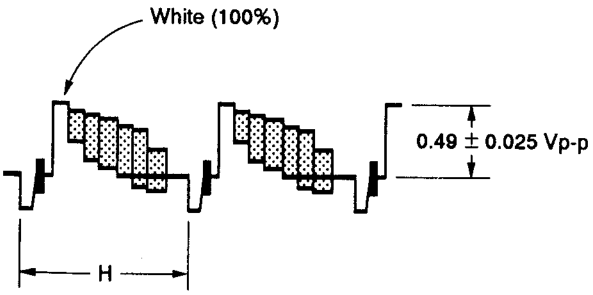


Fig. 9-16. SYNC AGC adjustment

9-5-7. Emphasis Input Level Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin (54) of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV205
Specified Value	0.50 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV205 so that it becomes 0.50 ± 0.025 Vp-p.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

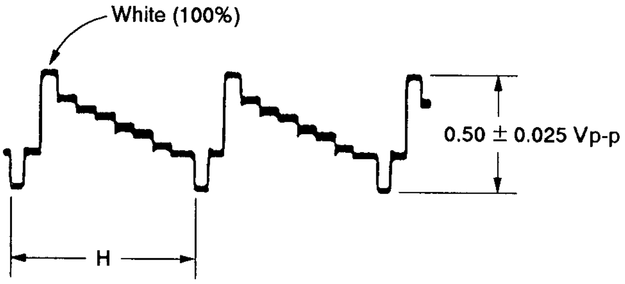


Fig. 9-17. Emphasis input level adjustment

9-5-8. PB Y Level 1 Adjustment (VS-67 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	Pin ㊼ of IC203 (Pin ⑤ of IC202)
Measuring Instrument	Oscilloscope
Adjustment Element	RV202
Specified Value	0.50 ± 0.025 Vp-p

Adjusting method:

1) Adjust to 0.50 ± 0.025 Vp-p with RV202.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

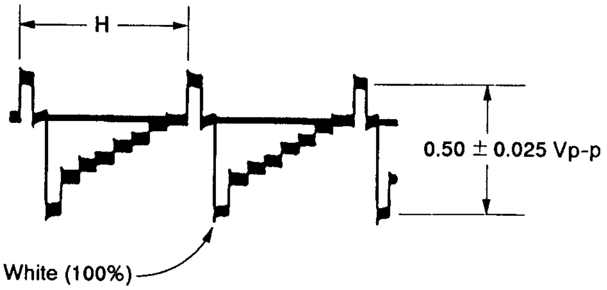


Fig. 9-18. PB Y level 1 adjustment

9-5-9. PB Y Level 2 Adjustment (VS-67 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Oscilloscope
Adjustment Element	RV208
Specified Value	$1.00^{+0.025}_{-0.05}$ Vp-p

Note: 1) Terminate VIDEO OUT (J901) at 75Ω.
2) Make sure that "PB Y Level 1 Adjustment" and "Emphasis Input Level Adjustment" have been completed.

Adjustment method:
1) Adjust with RV208 so that it becomes $1.00^{+0.025}_{-0.05}$ Vp-p.

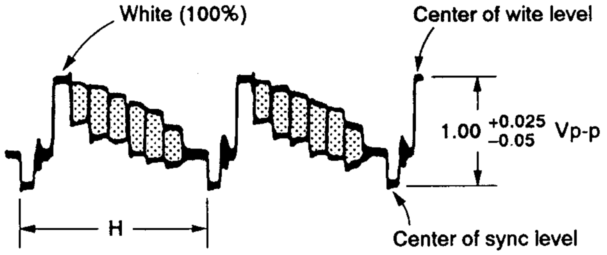


Fig. 9-19. PB Y level 2 adjustment

9-5-10. Y FM Carrier Frequency Adjustment (VS-67 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161^Note
Measuring Instrument	Frequency counter
Adjustment Element	RV204
Specified Value	4.39 ± 0.02 MHz

Note: TP161 is the check land. (See Fig. 9-23.)

Adjustment method:
1) Adjust to 4.39 ± 0.02 MHz with RV204.
2) Perform "Deviation Adjustment".

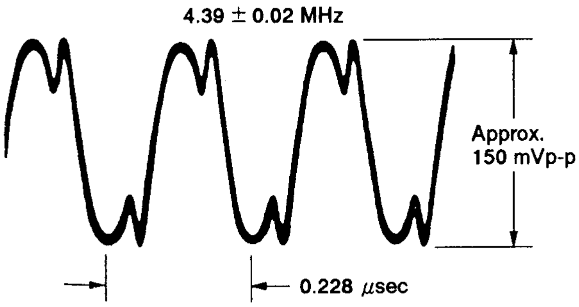


Fig. 9-20. Y FM carrier frequency adjustment

9-5-11. Y FM Deviation Adjustment (VS-67 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Oscilloscope
Adjustment Element	RV203
Specified Value	Playback level is 1.00 ± 0.04 Vp-p

Note: 1) Confirm that "Emphasis Input Level Adjustment", "PB Y Level 2 Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.
2) Terminate VIDEO OUT (J901) at 75Ω.

Adjustment method:
1) Record the color bar signal.
2) Playback the recorded signal.
3) Confirm the playback output.
Specified value: 1.00 ± 0.04 Vp-p
4) If the specified value is not satisfied, repeat 1) to 3) after turning RV203 in the following manner.

	Rotation direction of RV203
When larger than specified value	Clockwise (↻)
When smaller than specified value	Counterclockwise (↺)

Table 9-2.

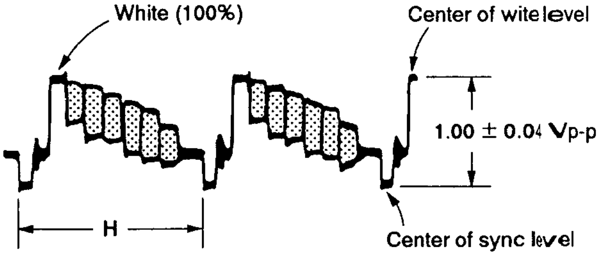


Fig. 9-21. Y FM deviation adjustment

9-5-12. Chroma Emphasis fo Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212$^{\text{Note}}$ (emitter of Q241)
Measuring Instrument	Oscilloscope
Adjustment Element	FL201
Specified Value	Minimum fo component

Note: TP212 is the check land. (See Fig. 9-23.)

Adjustment method:

1) Adjust with FL201 so that amplitude of the flat section of the chroma signal REC section becomes minimum.

Minimize amplitude of flat section of chroma signal RED section

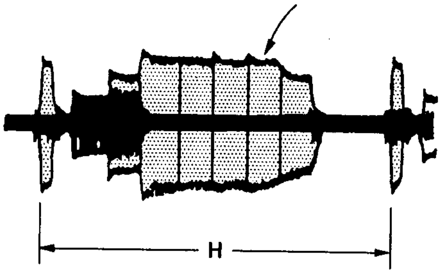


Fig. 9-22. Chroma emphasis fo adjustment

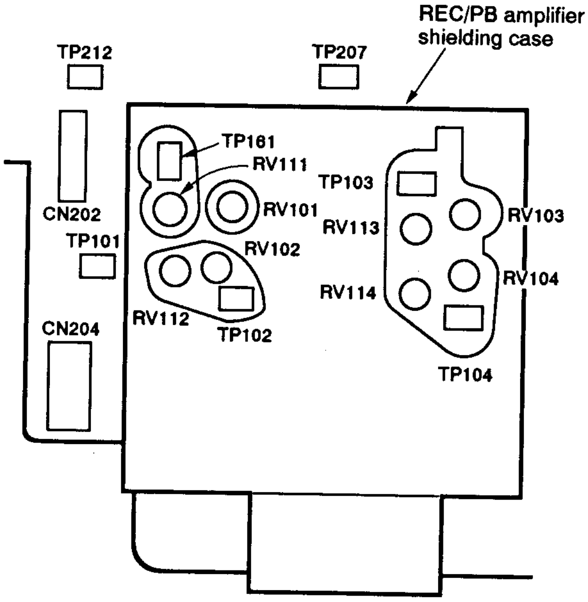

REC/PB amplifier shielding case
TP212
TP207
TP161
RV111
TP103
CN202
RV101
RV113
RV103
TP101
RV102
RV114
RV104
CN204
RV112
TP102
TP104

Fig. 9-23.

9-5-13. REC C RF Level Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212$^{\text{Note}}$ (emitter of Q241)
Measuring Instrument	Oscilloscope
Adjusting Element	RV210
Specified Value	236 ± 10 mVp-p

Note: TP212 is the check land. (See Fig. 9-23.)

Adjusting method:

1) Adjust RV210 so that the amplitude of flat red portion of the chroma signal becomes 236 ± 10 mVp-p.

Adjust amplitude of flat red portion of chroma signal to 236 ± 10 mVp-p.

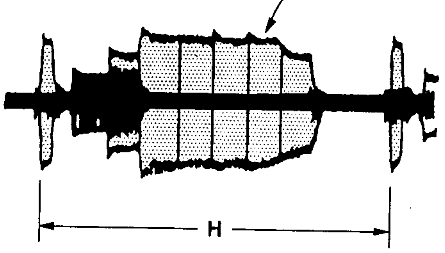


Fig. 9-24. REC C RF level adjustment

9-5-14. REC Y Level Adjustment (VS-67 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161$^{\text{Note}}$ (emitter of Q237)
Measuring Instrument	Oscilloscope
Adjusting Element	RV209
Specified Value	135 ± 5 mVp-p

Note: TP161 is the check land. (See Fig. 9-23.)

Adjusting method:

1) Adjust RV209 for 135 ± 5 mVp-p.

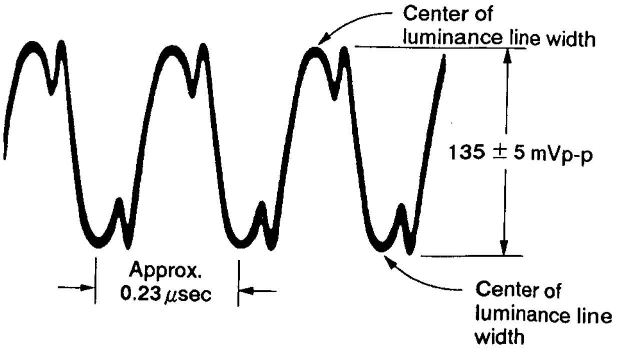

Center of luminance line width
135 ± 5 mVp-p
Approx. 0.23 µsec
Center of luminance line width

Fig. 9-25. REC Y level adjustment

9-5-15. REC C Current Adjustment (VS-67 Board)

Mode	Recording
Signal	Color bar
Measurement Point	CH-1 (1:1 probe): TP101 (connecting point between RV101 and R140) (1a)Note 1 TP103 (connecting point between RV103 and R144) (1b)Note 1 TP102 (connecting point between RV102 and R129) (2a)Note 1 TP104 (connecting point between RV104 and R123) (2b)Note 1 CH-2 (10:1 probe): Pin ⑤ (1/2 RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV101 (1a) RV103 (1b) RV102 (2a) RV104 (2b)
Specified Value	16.0 ± 1.3 mVp-p

Note: 1) TP101 to TP104 are the check land. (See Fig. 9-23.)
2) Use the MP type tape.

Connections:
1) Remove CN802 on the AU-86 board.
2) Connect the Q543 emitter (REC ATF) and the collector on the VS-67 board with a jumper wire.

Adjusting method:
1) Adjust each RV so that the output waveforms of 1a, 1b, 2a, and 2b become 16.0 ± 1.3 mVp-p.

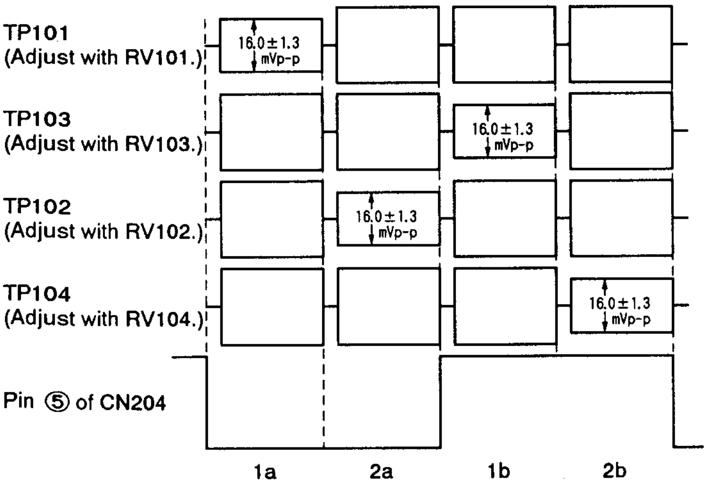


Fig. 9-26. REC C current adjustment

9-5-16. REC ATF Current Check (VS-67 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP101 (connecting point between RV101 and R140)Note 1 (1a) TP103 (connecting point between RV103 and R144)Note 1 (1b) TP102 (connecting point between RV102 and R129)Note 1 (2a) TP104 (connecting point between RV104 and R123)Note 1 (2b)
Measuring Instrument	Oscilloscope (1:1 probe)
Specified Value	5.5 ± 1.5 mVp-p (1a) 5.0 ± 1.5 mVp-p (1b) 5.5 ± 1.5 mVp-p (2a) 5.5 ± 1.5 mVp-p (2b)

Note: 1) TP101 to TP104 are the check land. (See Fig. 9-23.)
2) Use the MP type tape.

Connection:
1) Remove CN802 on the AU-86 board.

Checking method:
1) Trigger a 9.9 μsec (1 cycle) waveform superposed to the output waveform of TP101 (1a), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.
2) Trigger a 6.1 μsec (1 cycle) waveform superposed to the output waveform of TP103 (1b), and confirm that the waveform level is 5.0 ± 1.5 mVp-p.
3) Trigger a 8.5 μsec (1 cycle) waveform superposed to the output waveform of TP102 (2a), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.
4) Trigger a 6.8 μsec (1 cycle) waveform superposed to the output waveform of TP104 (2b), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.

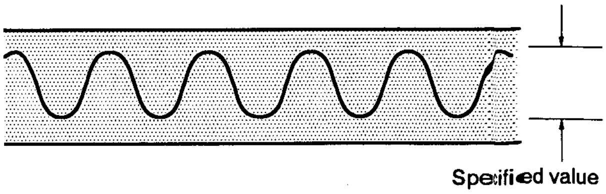


Fig. 9-27. REC ATF current check

9-5-17. Feedback Chroma Adjustment (PD-18 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Emitter of Q205
Measuring Instrument	Oscilloscope
Adjustment Element	RV201

Note: Remove the MD frame assembly to perform adjustments.

Adjusting method:

1) Set RV201 extreme counterclockwise position. (See Fig. 9-31.)
2) Turn RV201 sloely clockwise and stop where the correlative chroma component is minimum.

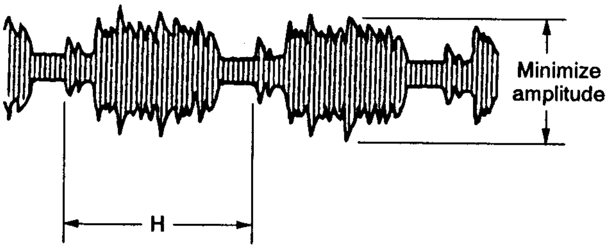


Fig. 9-28.

9-5-18. Quasi Burst Phase Adjustment (VS-67 Board)

1. Method using vectorscope

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Vectorscope
Adjusting Element	RV212
Specified Value	Phase of color luminance points in quasi burst mode is same as phase of color luminance points in through burst mode

Adjusting method:

1) Memorize of the phase of the color luminance points (especially yellow). (Through burst mode)
2) Connect cathode of D216 and Pin ④ of CN201 with a diode (1SS119, etc.). (Quasi burst mode)

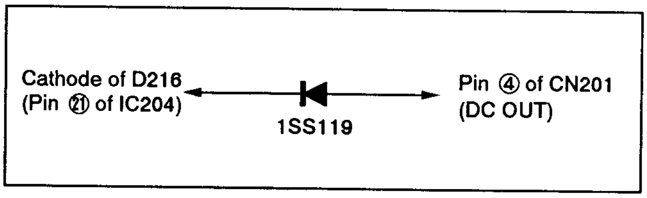


Fig. 9-29.

3) Confirm the color of color bars on the monitor screen. If abnormal, stop the unit and then set the playback mode again.
4) Adjust RV212 so that the phase of the color luminance points is the same as the phase memorized in 1).
5) Remove the diode.

2. Method using monitor TV

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV212
Specified Value	Minimum chroma flickering

Connection:

1) Connect cathode of D216 and Pin ④ of CN201 using a diode (1SS119, etc.).

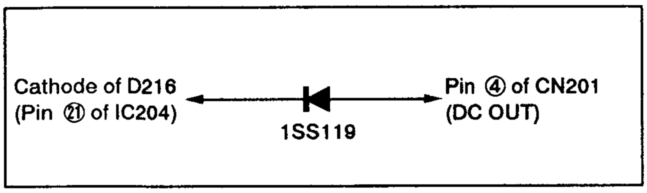

Cathode of D216
(Pin ㉑ of IC204)
1SS119
Pin ④ of CN201
(DC OUT)

Fig. 9-30.

Adjusting method:

1) Observe the monitor screen. If color is abnormal, stop the unit and then set the playback mode again.
2) Set the monitor color level to maximum and its bright level to minimum.
3) Rotate RV212 fully in the counterclockwise direction (○).
4) Turn RV212 slowly clockwise and stop where chroma flicker is minimum and horizontal black stripes are least visible.
5) Remove the diode.

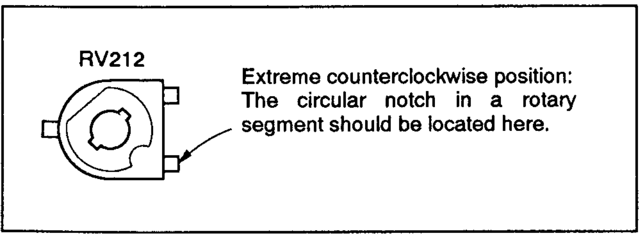

RV212
Extreme counterclockwise position:
The circular notch in a rotary segment should be located here.

Fig. 9-31.

9-5-19. Delay Burst Phase Adjustment (VS-67 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape for operation check (WR5-4CL) color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV213
Specified Value	Minimum chroma flickering

Adjusting method:

1) Set the monitor TV color level to maximum and its bright level to minimum.
2) Minimize chroma flicker with RV213 so that horizontal black stripes cannot longer be seen.

9-6. AUDIO SYSTEM ADJUSTMENTS

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]

Connect to the video system measuring instruments, and the audio system measuring instruments as shown in the Fig. 9-32, and set the power switch to VTR (or PLAYER) position for adjustment.

Set the input/output selector switch (S921)Note 1 according to the mode as follows.

- Input position ·············· Recording mode
- Output position ············ Playback mode

Unless otherwise specified, set the bilingual switch (S941 on the EL-10 board) to the following position.

- Green (stereo) position

Set the EDIT switch (S766 on the CF-1 board) to the following position.

- EDIT OFF (SP mode recording)

Note: 1) As for AEP/UK model, S921 is forcibly fixed to output side by the cabinet (L) and the output cover.

2) Unless otherwise specified, input the same signal to both channel of L and R when input a audio signal.

3) Be sure to insert plug (shorting plug or dummy plug, etc.) into AUDIO input/output R terminal. If not, the mode will be monaural and an appropriate adjustment can not be performed.

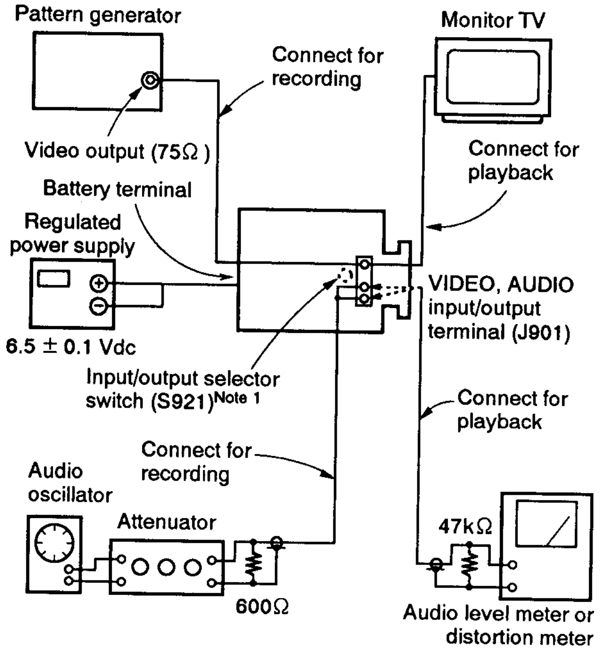
(Monaural mode)

When recording······· REC AFM RF 1.7 MHz carrier is not output.

When playback ······· L+R signal is output from AUDIO input/output L terminal.

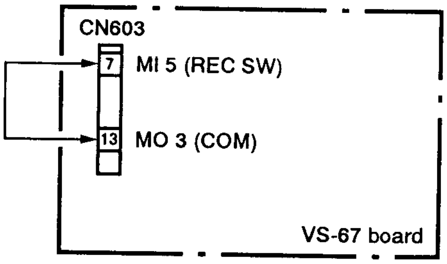
4) In adjustments which is performed for both R and L channels, the adjusting element for R channel is shown in brackets [ ].

- Connection of measuring instruments



Pattern generator
Monitor TV
Connect for recording
Video output (75Ω)
Connect for playback
Battery terminal
Regulated power supply
VIDEO, AUDIO input/output terminal (J901)
6.5 ± 0.1 Vdc
Input/output selector switch (S921)Note 1
Connect for playback
Connect for recording
Audio oscillator
Attenuator
47kΩ
600Ω
Audio level meter or distortion meter

- Setting the REC mode in models without REC switch connect Pins ⑦ and ⑬ of CN603 on the VS-67 board with a jumper wire until the VTR enter the REC mode.



CN603
7
MI 5 (REC SW)
13
MO 3 (COM)
VS-67 board

Fig. 9-32.

[Adjustment procedure]

1) 1.5 MHz carrier frequency adjustment
2) 1.7 MHz carrier frequency adjustment
3) 1.5 MHz recording level check
4) 1.7 MHz recording level check
5) E-E output level check
6) REC matrix L+R check
7) REC matrix L–R check
8) 1.5 MHz deviation adjustment
9) 1.7 MHz deviation adjustment
10) PB matrix L adjustment
11) Overall level characteristics, separation check
12) Overall distortion check
13) Overall noise level check

9-6-1. 1.5 MHz Carrier Frequency Adjustment (AU-85 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑳ of CN701
Measuring Instrument	Frequency counter
Adjusting Element	RV702
Specified Value	1.500 ± 0.002 MHz

Note: Use a 10:1 probe for connecting the frequency counter.

Connections:

1) Connect the check land JL800 on the AU-86 board (Pin ㉕ of IC801: PB/$\overline{\text{REC}}$) to Pin ④ of CN802 (AUDIO 5V) with a jumper wire.

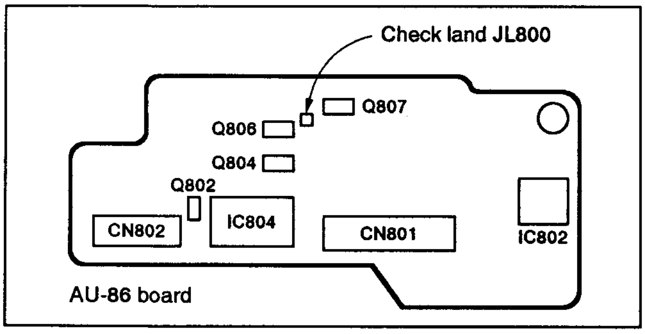


Fig. 9-33.

Adjusting method:

1) Adjust RV702 so that the carrier frequency becomes 1.500 ± 0.002 MHz.

9-6-2. 1.7 MHz Carrier Frequency Adjustment (AU-85 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑲ of CN701
Measuring Instrument	Frequency counter
Adjusting Element	RV705
Specified Value	1.700 ± 0.002 MHz

Note: Use a 10:1 probe for connecting the frequency counter.

Connections:

1) Connect the check land JL800 on the AU-86 board (Pin ㉕ of IC801: PB/$\overline{\text{REC}}$) to Pin ④ of CN802 (AUDIO 5V) with a jumper wire.

Adjusting method:

1) Adjust RV705 so that the carrier frequency becomes 1.700 ± 0.002 MHz.

9-6-3. 1.5 MHz Recording Level Check (AU-86 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑦ of CN802
Measuring Instrument	Oscilloscope
Specified Value	108 ± 20 mVp-p

Connections:

1) Pull out the pin plug from AUDIO input/output R terminal. (Monaural recording mode)

Checking method:

1) Confirm that the 1.5 MHz REC AFM RF signal level is 108 ± 20 mVp-p.
   (Read the center level of the luminance line width.)

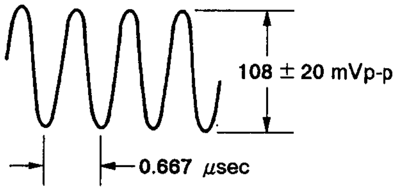


Fig. 9-34.

9-6-4. 1.7 MHz Recording Level Check (AU-86 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑦ of CN802
Measuring Instrument	Oscilloscope
Specified Value	97 ± 18 mVp-p

Connections:

1) Connect Pin ③ of Q802 (emitter) to Pin ④ of CN802 (AUDIO 5V) with a jumper wire.

Checking method:

1) Confirm that the shorting plug is inserted into AUDIO input/output R (red) terminal.
2) Confirm that the 1.7 MHz REC AFM RF signal level is 97 ± 18 mVp-p.
   (Read the center level of the luminance line width.)

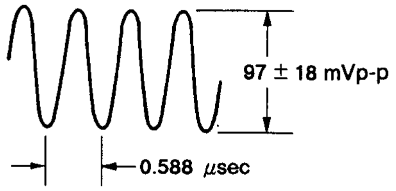


Fig. 9-35.

9-6-5. E-E Output Level Check (AU-85 Board)

Mode	Recording
Signal	400 Hz, –7.5dBs : AUDIO input/output L [R] terminal
Measurement Point	Pin ⑨ [Pin ③] of IC803
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2dBs)

Checking method:

1) Confirm that the 400 Hz signal level is $925\ ^{+240}_{-190}$ mVp-p (–7.5 ± 2 dBs).

9-6-6. REC Matrix L+R Check (AU-85 Board)

Mode	Recording
Signal	1. 400 Hz, –7.5 dBs: AUDIO input/output L terminal 2. 400 Hz, –7.5 dBs: AUDIO input/output R terminal
Measurement Point	Pin ① of IC702
Measuring Instrument	Oscilloscope
Specified Value	The level difference between L input and R input is 0 ± 6 mVp-p.

Note: When measuring signal level at Pin ① of IC702, start measuring 1 minute after the signal input. (To stabilize AGC)

Checking method:

1) Input 400 Hz, –7.5 dBs signal only to AUDIO input/output L terminal. (Insert the shorting plug into AUDIO input/output R terminal.)
2) Read the signal level at Pin ① of IC702 and make a note of it. (Approx. 300 mVp-p)
3) Input 400 Hz, –7.5 dBs signal only to AUDIO input/output R terminal. (Insert the shoring plug to AUDIO input/output L terminal.)
4) Confirm that the level at Pin ① of IC702 is [the level measured in step 2] ± 6 mVp-p.

9-6-7. REC Matrix L–R Check (AU-85 Board)

Mode	Recording
Signal	400 Hz, –7.5 dBs: Input into AUDIO input/output R and L terminals
Measurement Point	Pin ⑭ of IC702
Measuring Instrument	Oscilloscope
Specified Value	0 ± 10 mVp-p

Note: Use a 1:1 probe.

Checking method:

1) Confirm that the 400 Hz signal level is 0 ± 10 mVp-p.

9-6-8. 1.5 MHz Deviation Adjustment (AU-85 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Pin ⑨ of IC803 on AU-86 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV701
Specified Value	925 ± 21 mVp-p (–7.5 ± 0.2 dBs)

Switch setting:

- Bilingual switch (S941 on the EL-10 board)......Main

Adjusting method:

1) Adjust RV701 so that the 400 Hz signal level becomes 925 ± 21 mVp-p.

9-6-9. 1.7 MHz Deviation Adjustment (AU-85 Board)

Mode	Playback
Signal	Alignment tape for AFM stereo operation check ( ) Bilingual (monoscope) section
Measurement Point	Pin ③ of IC803 on AU-86 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV703
Specified Value	400 Hz level:1 kHz level =8:(7.45 ± 0.05)

Connection:

1) To inhibit the MONO/STEREO discrimination, and set to the forcible stereo mode, connect with a jumper wire between Pin ⑮ (MONO/$\overline{\text{STEREO}}$) of CN801 or Pin ③ of Q811 (emitter) and GND on the AU-85 board.

Adjusting method:

1) Confirm that the bilingual switch is set to the green color (stereo) position.
2) Connect a jumper wire between Pin ② of FL802 and GND on the AU-86 board.
3) Adjust the scale of 400 Hz signal level to 8 with the VOLTS/DIV knob of the oscilloscope.
4) Remove the jumper wire connected in the step 2), connect with a jumper wire between Pin ② of FL801 and GND on the AU-86 board.
5) Adjust the scale of 1 kHz signal level to 7.45 ± 0.05 with RV704.

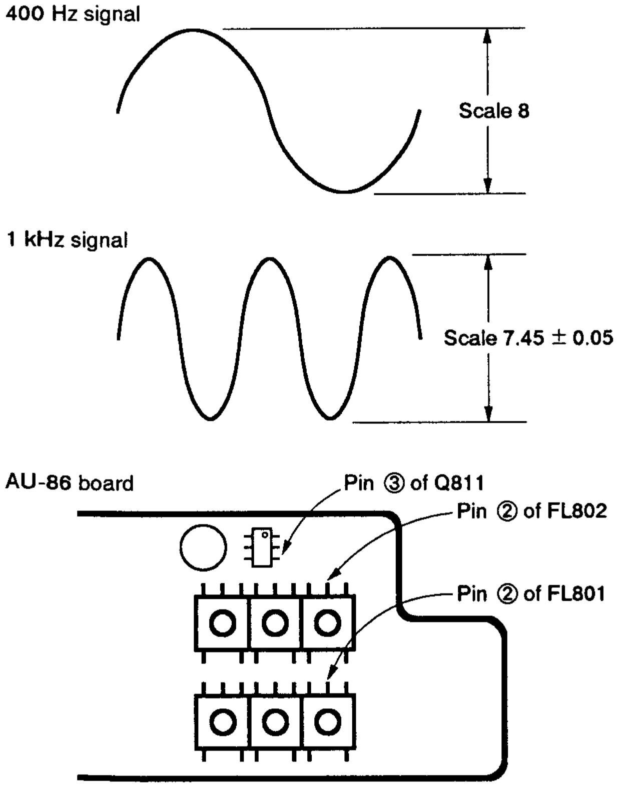


Fig. 9-36.

9-6-10. PB Matrix L Adjustment (AU-85 Board)

Mode	Self-recording/playback
Signal	Non signal: AUDIO input/output terminal L 400 Hz, –7.5 dBs: AUDIO input/output terminal R
Measurement Point	Pin ⑨ of IC803
Measuring Instrument	Oscilloscope
Adjusting Element	RV704
Specified Value	400 Hz playback signal level is minimum.

Adjusting method:

1) Input 400 Hz, –7.5 dB audio signal to the AUDIO input/output terminal R only. (Insert the shorting plug to the AUDIO input/output terminal L.)
2) Record it.
3) Play back the recorded section.
4) Insert the dummy plug to the AUDIO input/output terminal R.
5) Adjust with RV704 so that the 400 Hz playback signal level becomes minimum.

9-6-11. Overall Level Characteristics, Separation Check

Mode	Self-recording and playback (SP)
Signal	400 Hz, –7.5 dBs: AUDIO input/output L [R] terminal Non-signal (insert a shorting plug): AUDIO input/output R [L] terminal
Measurement Point	AUDIO input/output R and L terminals
Measuring Instrument	Audio level meter
Specified Value	Signal level: –7.5 ± 2 dBs Crosstalk level: –40 dBs or less*1

Note: 1) Be sure to insert the dummy plug into the right terminal when measuring the left playback output level.

2) Confirm that the bilingual switch (S941 on the EL-10 board) is set on the green (stereo) position.

Checking method:

1) Record the signal.
2) Play back the recorded portion.
3) Confirm that the output level of AUDIO input/output L[R] terminal is –7.5 ± 2 dBs.
4) Confirm that the output level of AUDIO input/output R[L] terminal is –40 dBs or less*1.

*1: Value when the A curve auditory correction filter is used.

9-6-12. Overall Distortion Check

Mode	Self-recording and playback (SP)
Signal	400 Hz, –7.5 dBs
Measurement Point	AUDIO input/output L [R] terminal
Measuring Instrument	Distortion meter
Specified Value	0.8% or less*[1]

Checking method:

1) Record the signal.
2) Play back the recorded portion.
3) Confirm that the distortion is less than 0.8%. *[1]
   *1: Value when a distortion measuring filter (Fig. 9-37.) is used. Less than 1.0% when no filter is used.

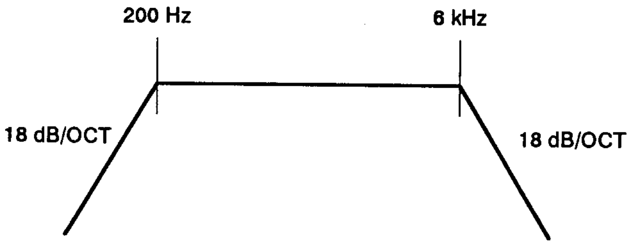


Fig. 9-37.

9-6-13. Overall Noise Level Check

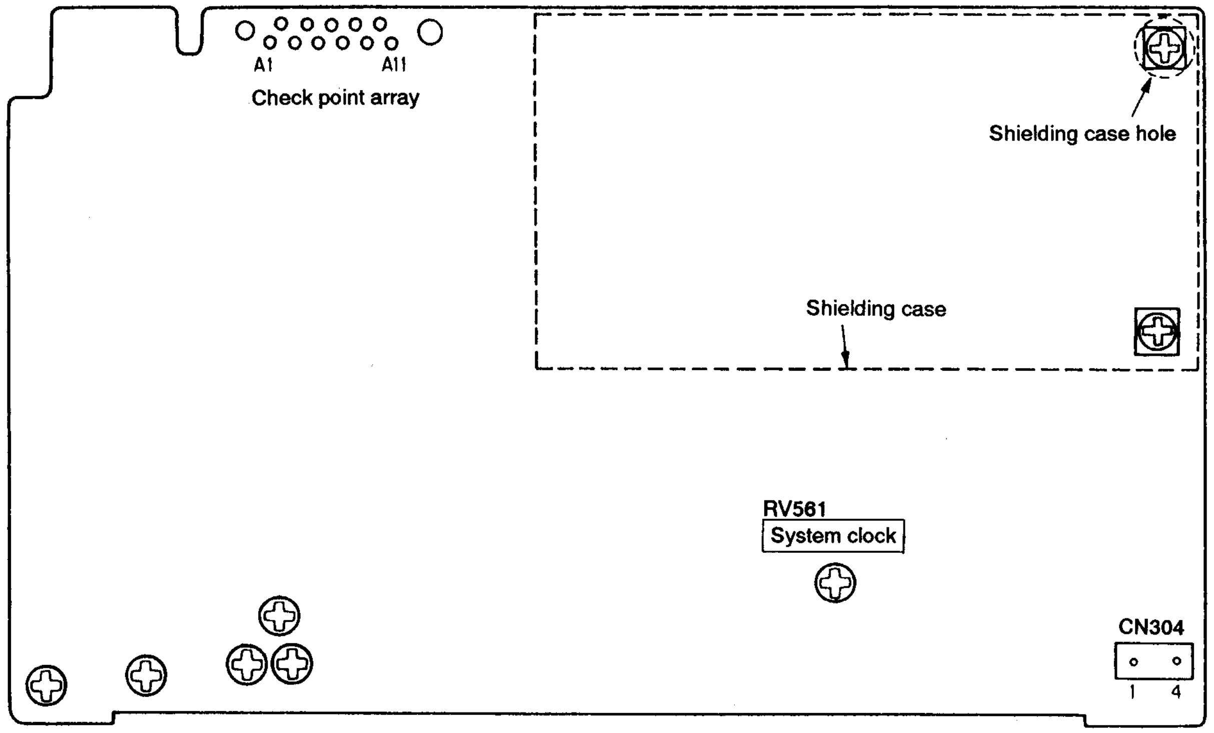
Mode	Self-recording and playback (SP)
Signal	Non-signal (insert the shorting plugs into both AUDIO input/output R and L terminals.)
Measurement Point	AUDIO input/output L [R] terminal
Measuring Instrument	Audio level meter
Specified Value	Less than –65.0 dBs*[2]

Checking method:

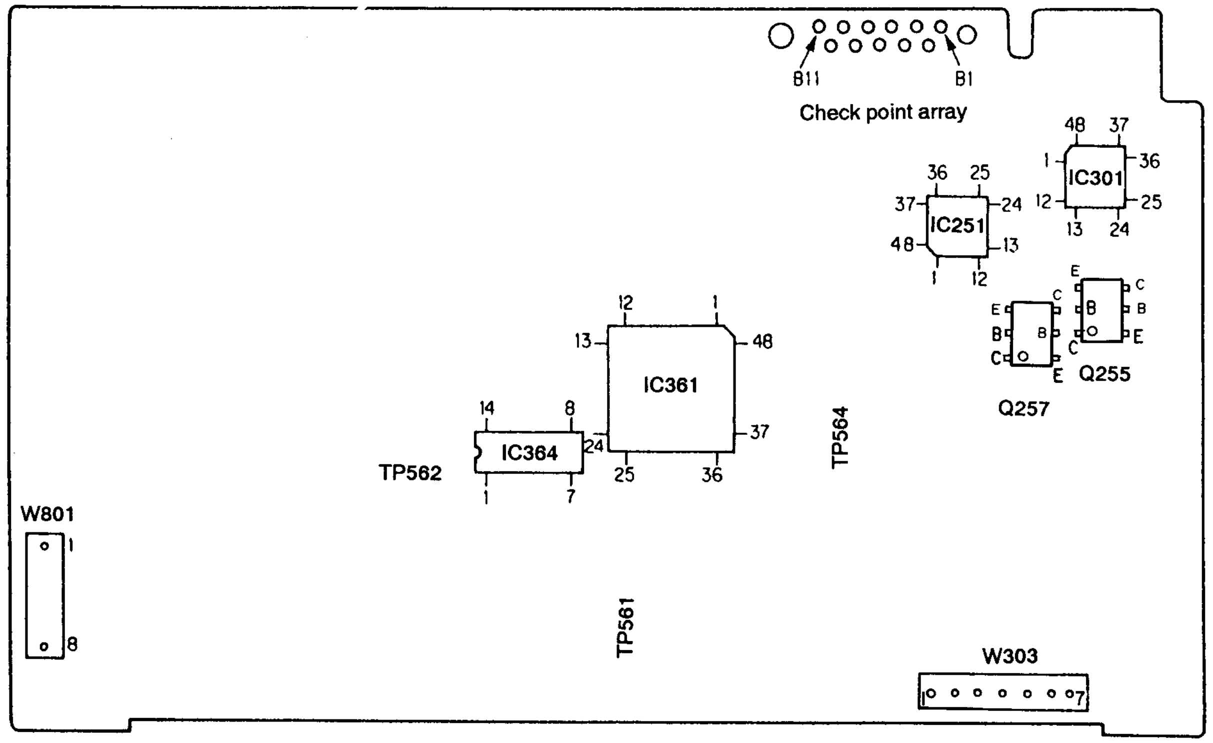
1) Record the signal
2) Play back the recorded portion.
3) Confirm that the noise level is less than –65.0 dBs. *[2]
   *2: Value when the A curve auditory correction filter is used.

9-7. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

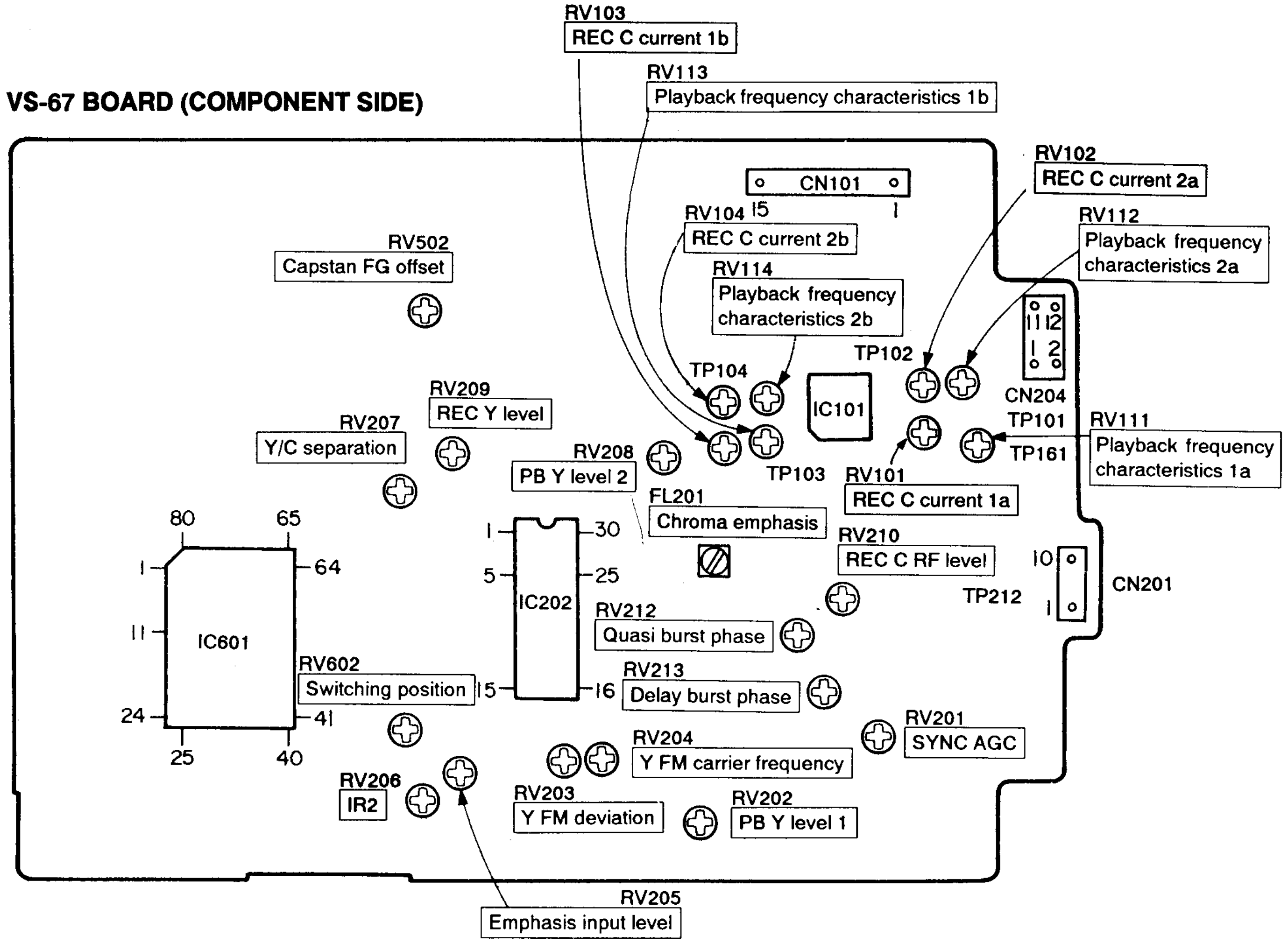
VC-80 BOARD (COMPONENT SIDE)
(Also illustrated on page 266.)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CN304
1
4

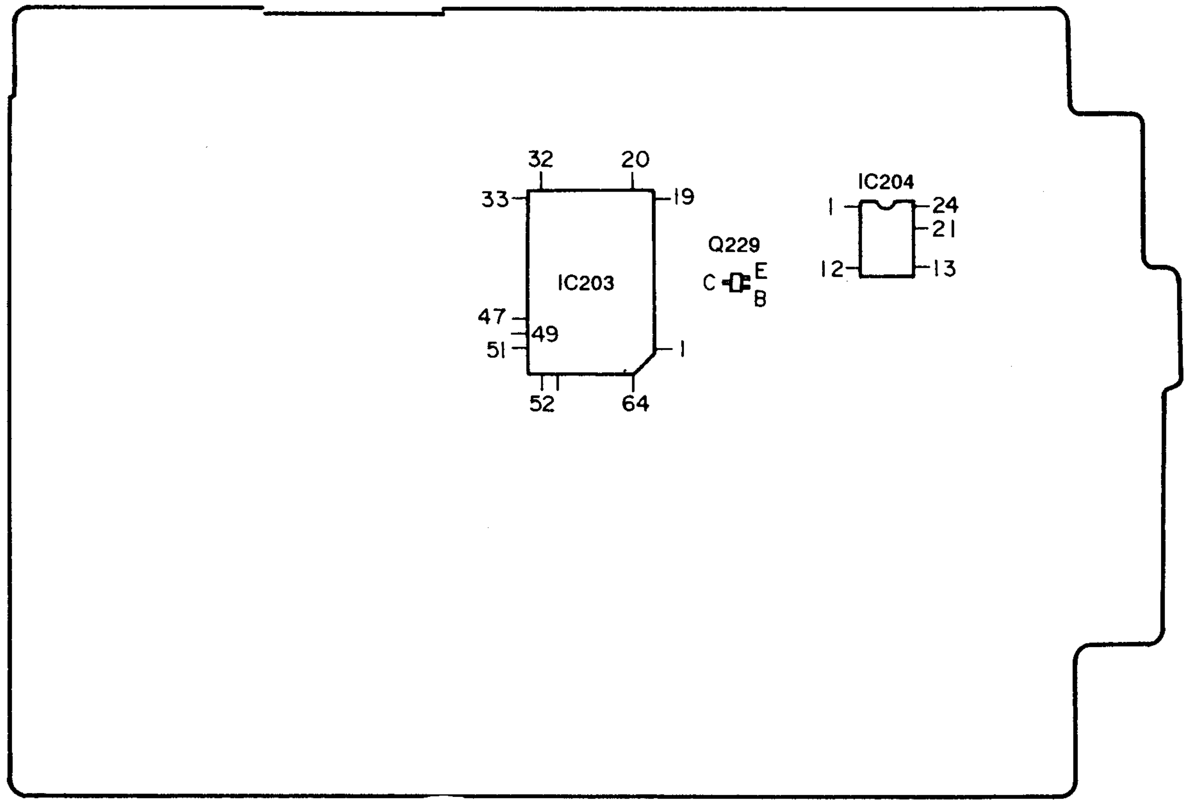
VC-80 BOARD (CONDUCTOR SIDE)
(Also illustrated on page 266.)


B11
B1
Check point array
IC301
IC251
IC361
IC364
Q255
Q257
TP562
TP564
TP561
W801
W303

VS-67 BOARD (COMPONENT SIDE)

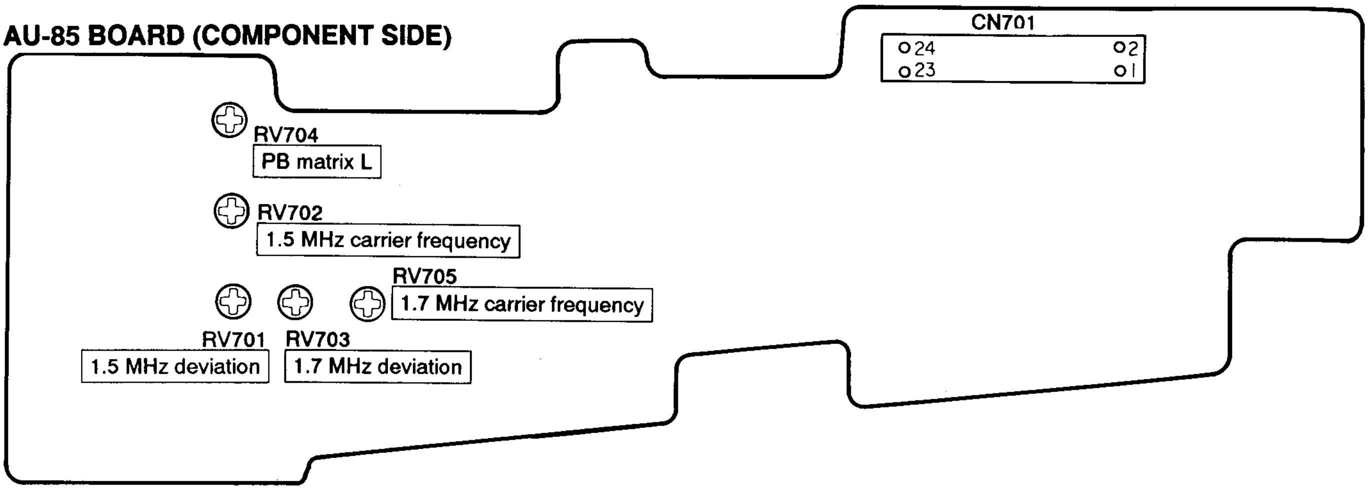

RV103
REC C current 1b
RV113
Playback frequency characteristics 1b
CN101
RV102
REC C current 2a
RV104
REC C current 2b
RV112
Playback frequency characteristics 2a
RV502
Capstan FG offset
RV114
Playback frequency characteristics 2b
TP102
TP104
CN204
RV209
REC Y level
IC101
TP101
RV111
RV207
Y/C separation
RV208
PB Y level 2
TP103
TP161
Playback frequency characteristics 1a
RV101
REC C current 1a
FL201
Chroma emphasis
RV210
REC C RF level
IC601
IC202
RV212
Quasi burst phase
TP212
CN201
RV602
Switching position
RV213
Delay burst phase
RV201
SYNC AGC
RV204
Y FM carrier frequency
RV206
IR2
RV203
Y FM deviation
RV202
PB Y level 1
RV205
Emphasis input level

VS-67 BOARD (CONDUCTOR SIDE)

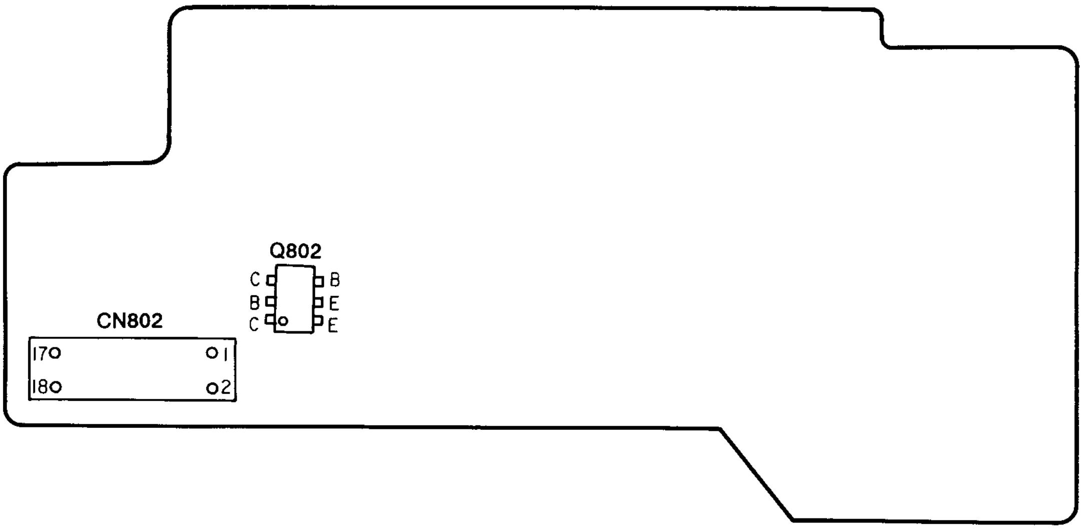

IC203
Q229
IC204

243

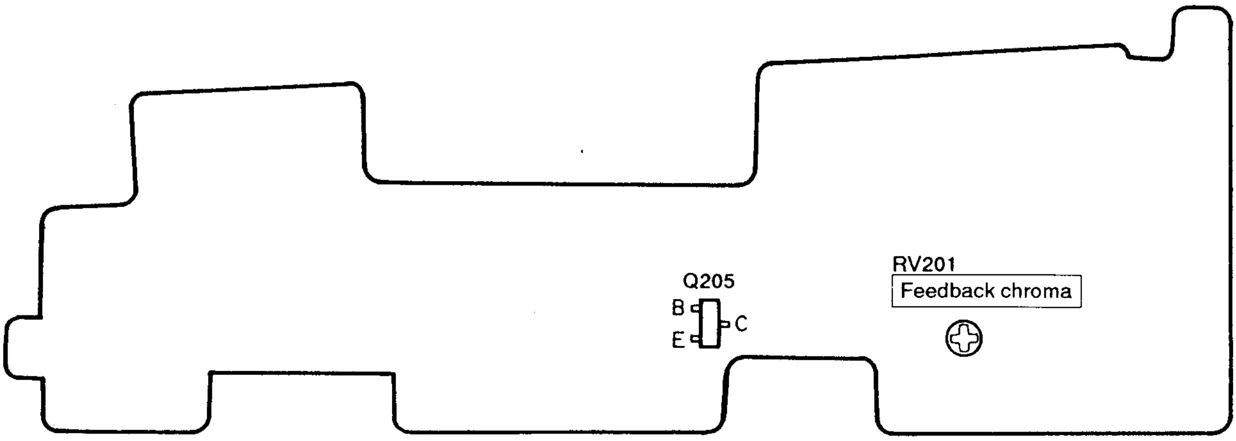
AU-85 BOARD (COMPONENT SIDE)


CN701
24
2
23
1
RV704
PB matrix L
RV702
1.5 MHz carrier frequency
RV705
1.7 MHz carrier frequency
RV701
1.5 MHz deviation
RV703
1.7 MHz deviation

AU-86 BOARD (CONDUCTOR SIDE)


Q802
C
B
C
B
E
E
CN802
17
1
18
2

PD-18 BOARD (COMPONENT SIDE)


Q205
B
E
C
RV201
Feedback chroma

CCD-TR75E

SONY

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model

SUPPLEMENT-1

File this supplement with the service manual.

The name and part code of the alignment tape for AFM operation check are modified.

☛: **Modified position**

1. Alignment Tape for AFM Stereo Operation Check

Tape	REC mode	Type	Tape speed	Contents		Use
				Video area	PCM area	
AFM stereo operation check WR5-9CS ☛ (8-967-995-28)	L	MP	LP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) Stereo section (color bar) L ch: 400 Hz, R ch: 1kHz (L+R: 1.5 MHz, ± 60 kHz DEV L–R: 1.7 MHz, ± 30 kHz DEV) Bilingual section (monoscope) ☛ MAIN: 400 Hz (1.5 MHz, ± 60 kHz DEV) ☛ SUB: 1 kHz (1.7 MHz, ± 30 kHz DEV)	• Audio signal (PCM) 400Hz: 8 min. ☛	AFM stereo operation check

Note: Recording mode
L ········· Conventional mode
E ········· Hi8 (high band) mode

Tape type
MP ········ Particle type metal tape
ME ········ Evaporated type metal tape

2. 1.7 MHz Deviation Adjustment (AU-85 Board)

Mode	Playback
Signal	Alignment tape for AFM stereo operation check (WR5-9CS) Bilingual (monoscope) section
Measurement Point	Pin ③ of IC803 on AU-86 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV703
Specified Value	400 Hz level:1 kHz level =8:(7.45 ± 0.05)

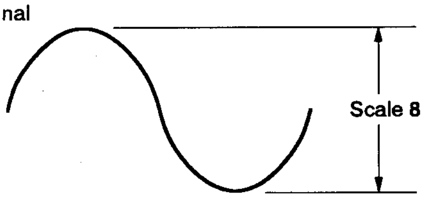
Connection:

1) To inhibit the MONO/STEREO discrimination, and set to the forcible stereo mode, connect with a jumper wire between Pin ⑮ (MONO/$\overline{\text{STEREO}}$) of CN801 or Pin ③ of Q811 (emitter) and GND on the AU-86 board.

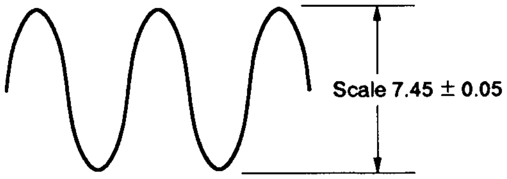
Adjusting method:

1) Confirm that the bilingual switch is set to the green color (stereo) position.
2) Connect a jumper wire between Pin ② of FL802 and GND on the AU-86 board.
3) Adjust the scale of 400 Hz signal level to 8 with the VOLTS/DIV knob of the oscilloscope.
4) Remove the jumper wire connected in the step 2), connect with a jumper wire between Pin ② of FL801 and GND on the AU-86 board.
5) Adjust the scale of 1 kHz signal level to 7.45 ± 0.05 with RV703.

400 Hz signal



1 kHz signal



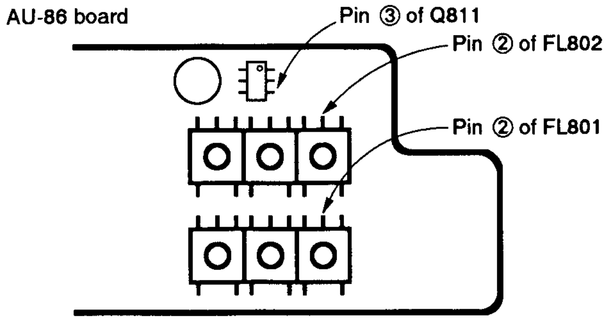


Fig. 1.

English
90J0970-1
Printed in Japan
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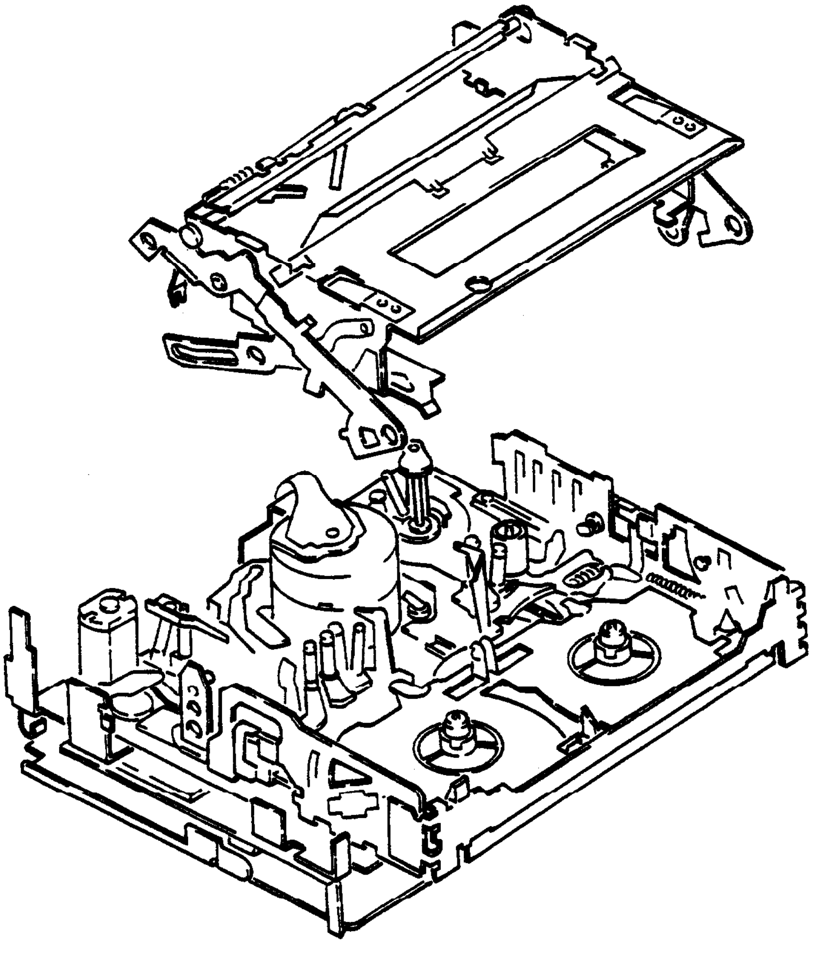
Sony Corporation
Personal Video Group
Published by Customer Relations and Service Group

9-972-977-81

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.

Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ●, and then, the LS support ●.
3) Remove the four screws ●, and then, the LS frame assy ●.
4) Remove the three lock washers ●, and then, the washer ●, bar, joint ●, T protector assy ●, and TP arm assy ● in that order.
5) Remove the two screws●, and then, the two arm shafts A●.
6) Remove the shaft through the long hole●. With the cassette compartment holder assembly●rotated in a direction of the arrowⒶ, remove the long holes●and●from the shaft in that order, and then, remove the cassette compartment holder assembly●.
7) Slide the BS holder●in a direction of the arrow Ⓑ as shown in Fig. A and remove it in a direction of the arrowⒸ.

Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ●.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder●in the reverse order of its removal. Note: Refer to Fig. A.
3) Mount the shafts in the order of the long holes ●, ●and● of the cassette compartment holder assembly●, respectively.

Note : When this is done. rotate the cassette compartment holder assembly●in a direction of the arrow Ⓐ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A●with the long holes of the LS chassis, fit them in firmly and fix with the two screws●.
5) Mount the TP arm assy ●, T protector assy ● and bar, joint ●, respectively. Then, mount the washer ● and three lock washers ●.
6) Mount the LS frame assy ● to the chassis and fix with the four screws ●.
7) Mount the LS support ● to the chassis and fix with the screw ●.

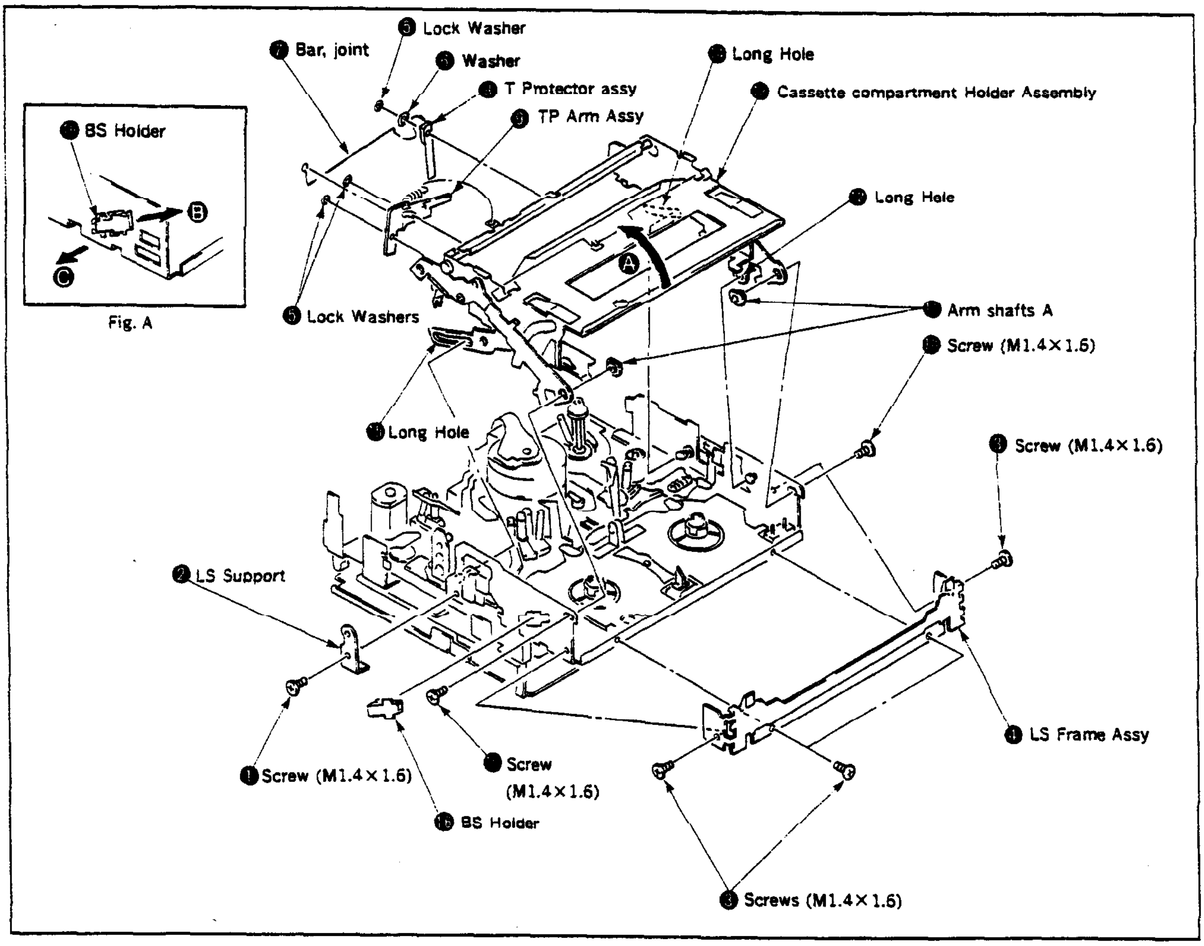

● BS Holder
Ⓑ
Ⓒ
Fig. A
● Lock Washer
● Bar, joint
● Washer
● T Protector assy
● TP Arm Assy
● Long Hole
● Cassette compartment Holder Assembly
● Long Hole
Ⓐ
● Lock Washers
● Arm shafts A
● Screw (M1.4×1.6)
● Long Hole
● Screw (M1.4×1.6)
● LS Support
● LS Frame Assy
● Screw (M1.4×1.6)
● Screw (M1.4×1.6)
● BS Holder
● Screws (M1.4×1.6)

Fig. 1

1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

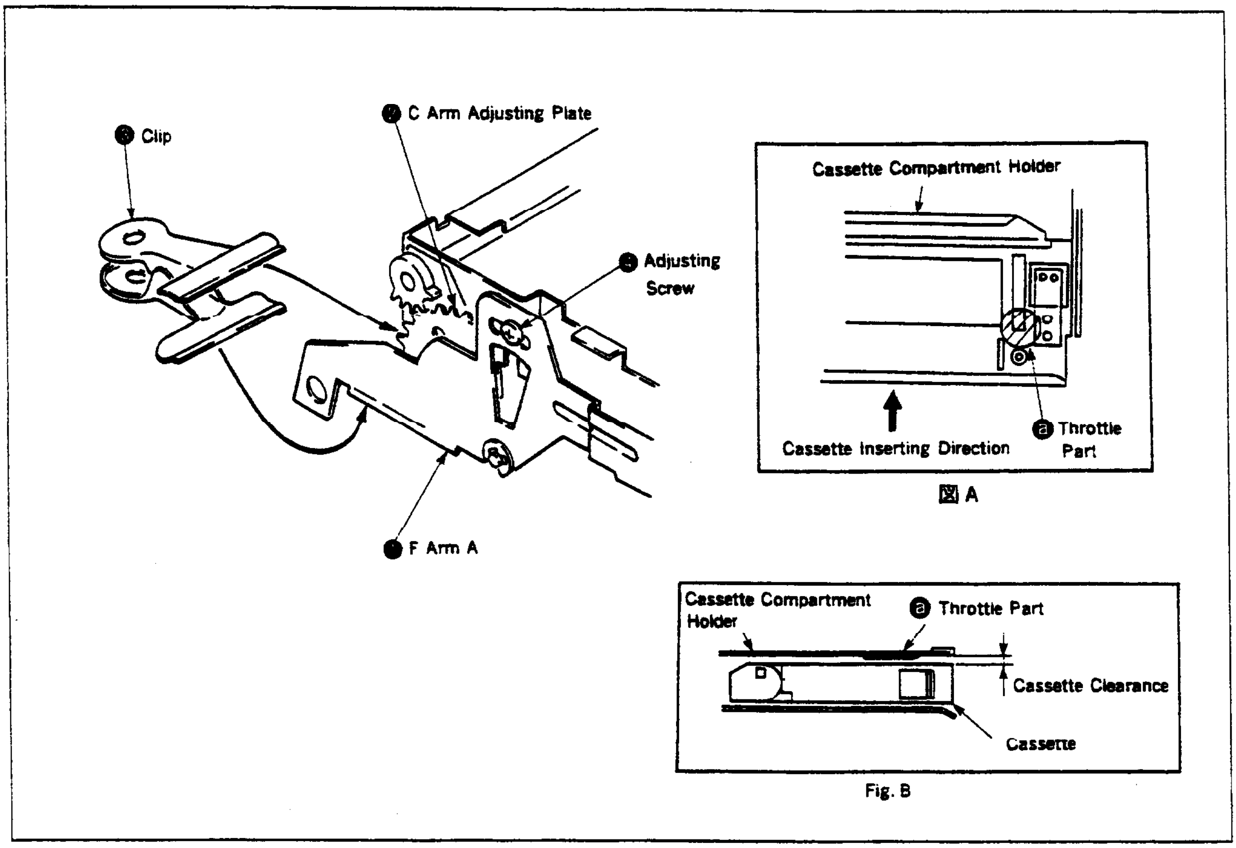
1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle partⓐ.

2) Pressing the partⓐ, nip the F arm A ● and the first tooth of the C arm adjusting plate ● with the clip ●, and tighten the adjusting screw ● at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ● after making sure of the following clearances between the throttle partⓐ of the cassette compartment holder and the cassette as shown in Fig. B.

- For 15mm-thick dummy cassette : 0.5 – 0.9
- For 15.2mm-thick dummy cassette : 0.3 – 0.7


● Clip
● C Arm Adjusting Plate
● Adjusting Screw
● F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ● on the LED assembly ●.
3) Press the pin of the push switch ● (ON state) and fix it with adhesive tape ● in that state.
4) Press the locking plate release arm ● in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ● and ● for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ● and ●.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

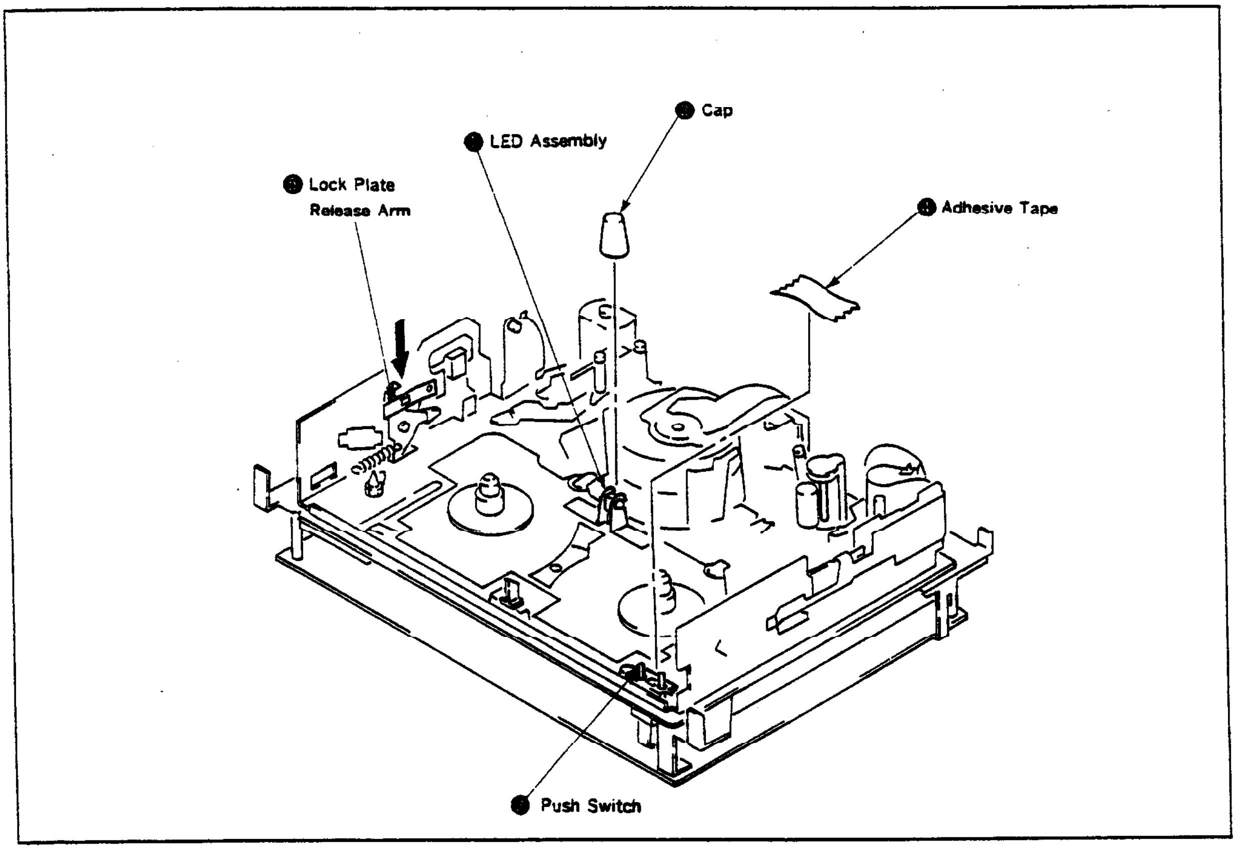


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

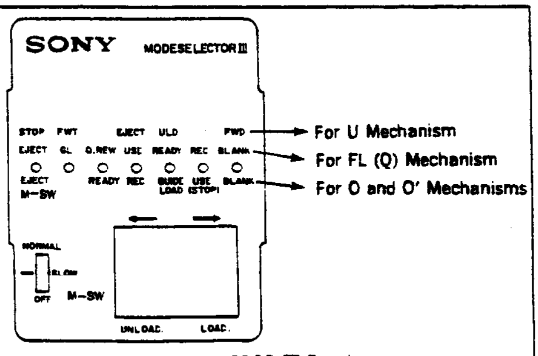
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ●.
2) Remove the screw ●, and then, the LB-12 board ●.
3) Remove the FP-114 flexible connector ● and loading motor connector ●, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

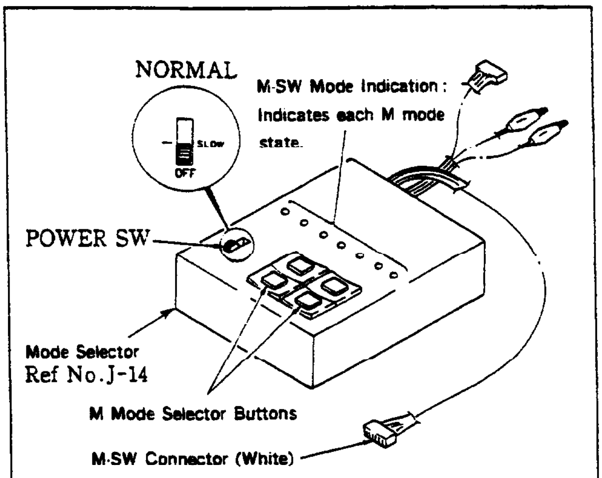

NORMAL
SLOW
OFF
POWER SW
M-SW Mode Indication : Indicates each M mode state.
Mode Selector
Ref No.J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

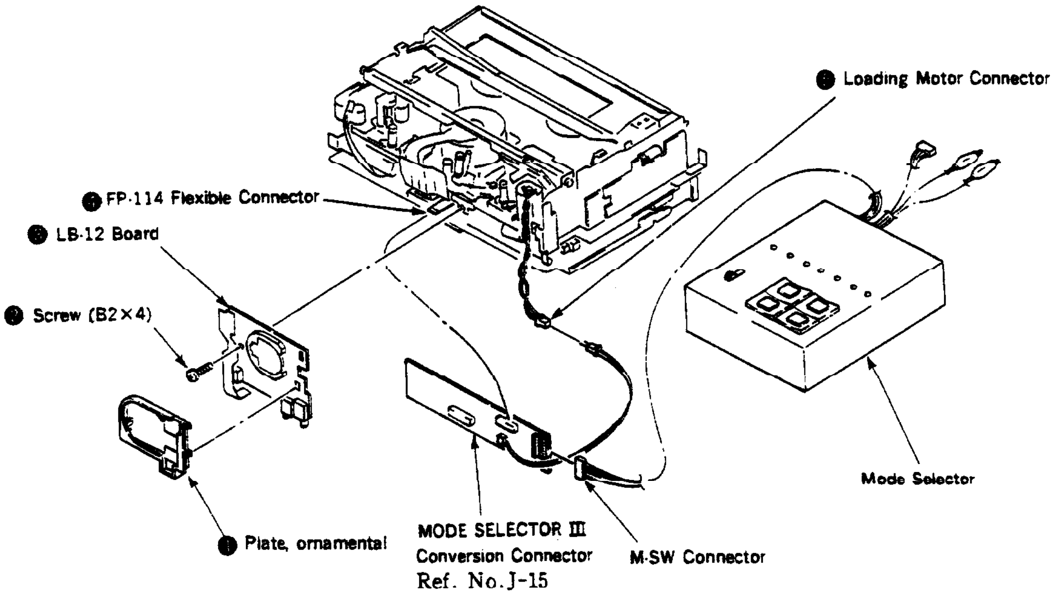
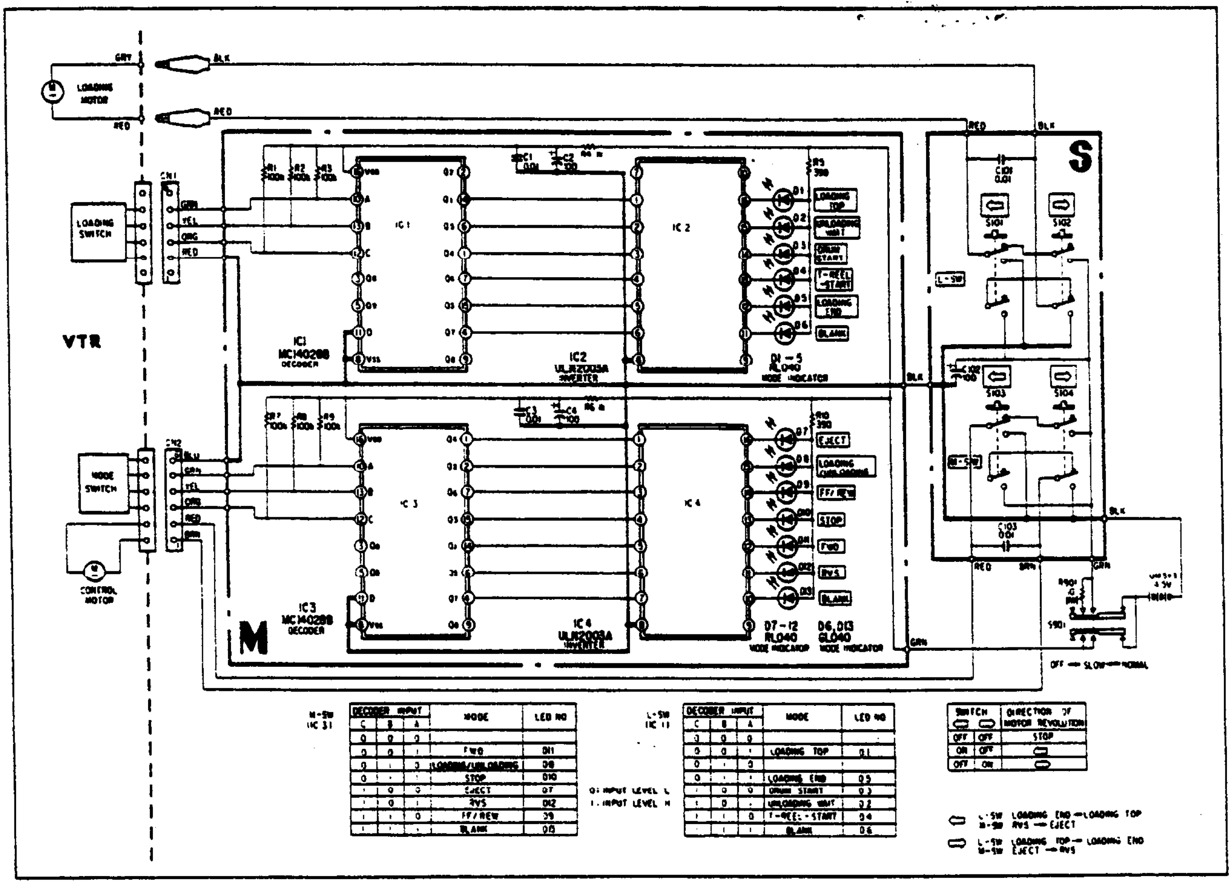

● Loading Motor Connector
● FP-114 Flexible Connector
● LB-12 Board
● Screw (B2×4)
● Plate, ornamental
MODE SELECTOR III
Conversion Connector
Ref. No.J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
D1-5 RL040 MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL-START
LOADING END
BLANK
S
S101
S102
S103
S104
L-SW
M-SW
C101 0.01
C102 100
C103 0.01
CN2
MODE SWITCH
BLU
BRN
CONTROL MOTOR
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
M
EJECT
LOADING/UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7-12 RL040 MODE INDICATOR
D6,D13 GL040 MODE INDICATOR
R901
S901
OFF — SLOW — NORMAL
0: INPUT LEVEL L
1: INPUT LEVEL H
⊂⊃ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT
⊂⊃ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⊂⊃	⊂⊃	
OFF	OFF	STOP
ON	OFF	⊂⊃
OFF	ON	⊂⊃

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

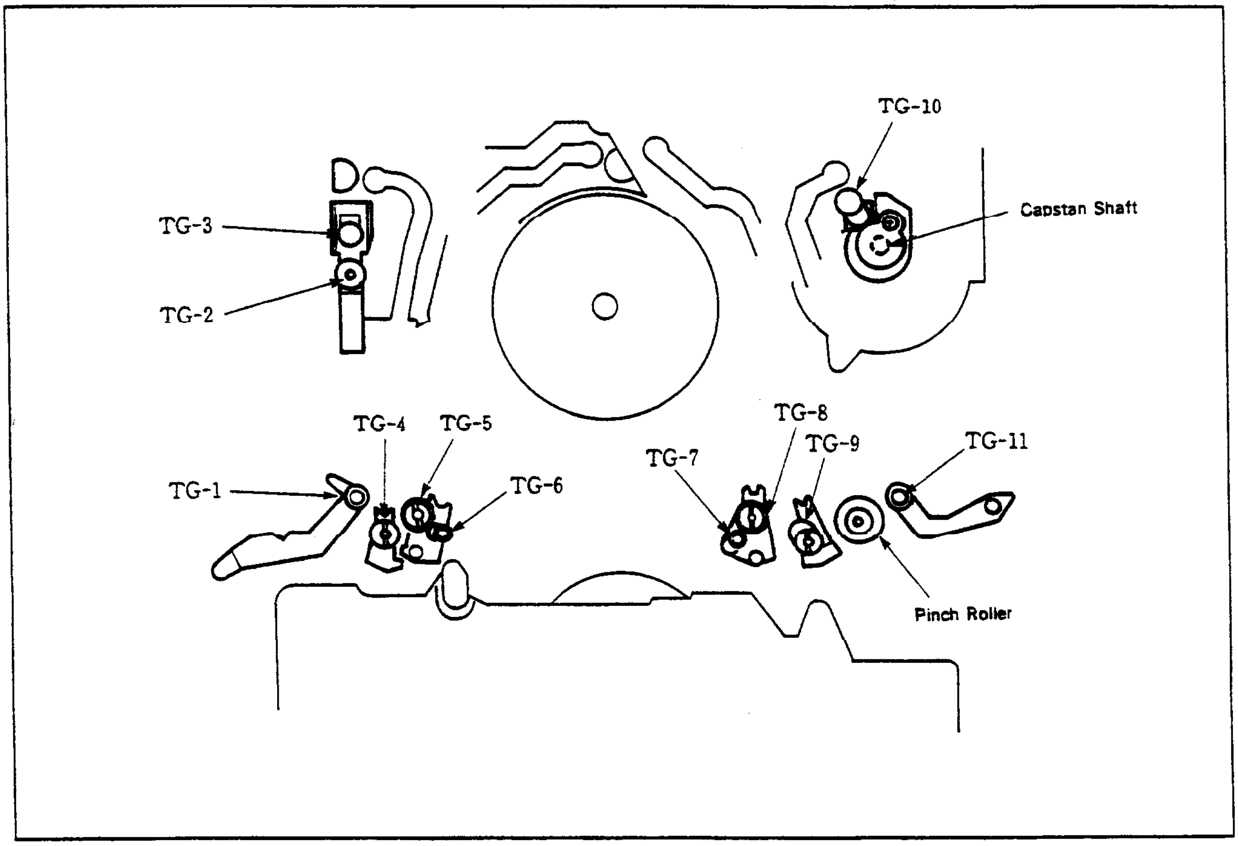


Fig. 7

2-3 PERIODIC CHECK ITEMS

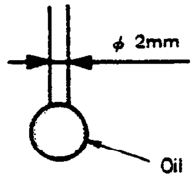
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape transportion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-212-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

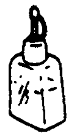


2-4 Service jigs list

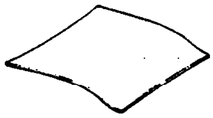
Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector III panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector III conversion connector	J-6082-021-A		

Other equipment
- Oscilloscope
- Analog tester (20kΩ)

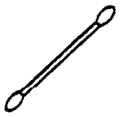
J-1



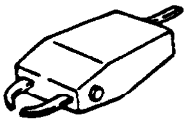
J-2



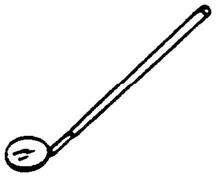
J-3



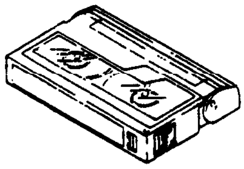
J-4



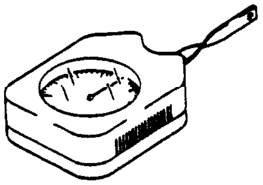
J-5



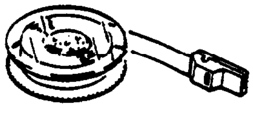
J-6



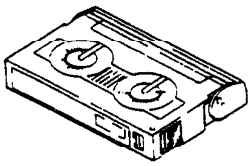
J-7



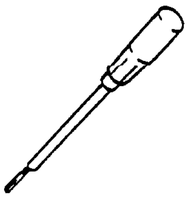
J-8



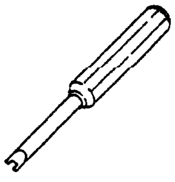
J-9



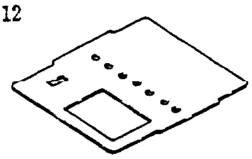
J-10



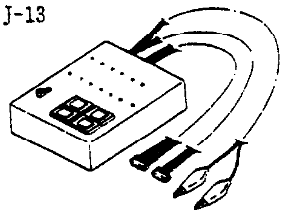
J-11



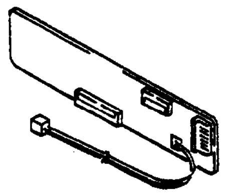
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A, rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrow Ⓑ.
4) Remove the three screws ●, ● and ●.
5) Lifting the LED base ●, remove it by pushing it in a direction of the arrow Ⓒ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ● of the LED base ● in the notch ● of the LS chassis without catching the LED in between. Next, fit to the dowels ● at 2 places.
3) Mount and tighten the screws ●, ● and ● in that order.
4) As shown in Fig. B, set the LED in a direction of the arrow Ⓐ and rotate it in a direction of the arrow Ⓑ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ● of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

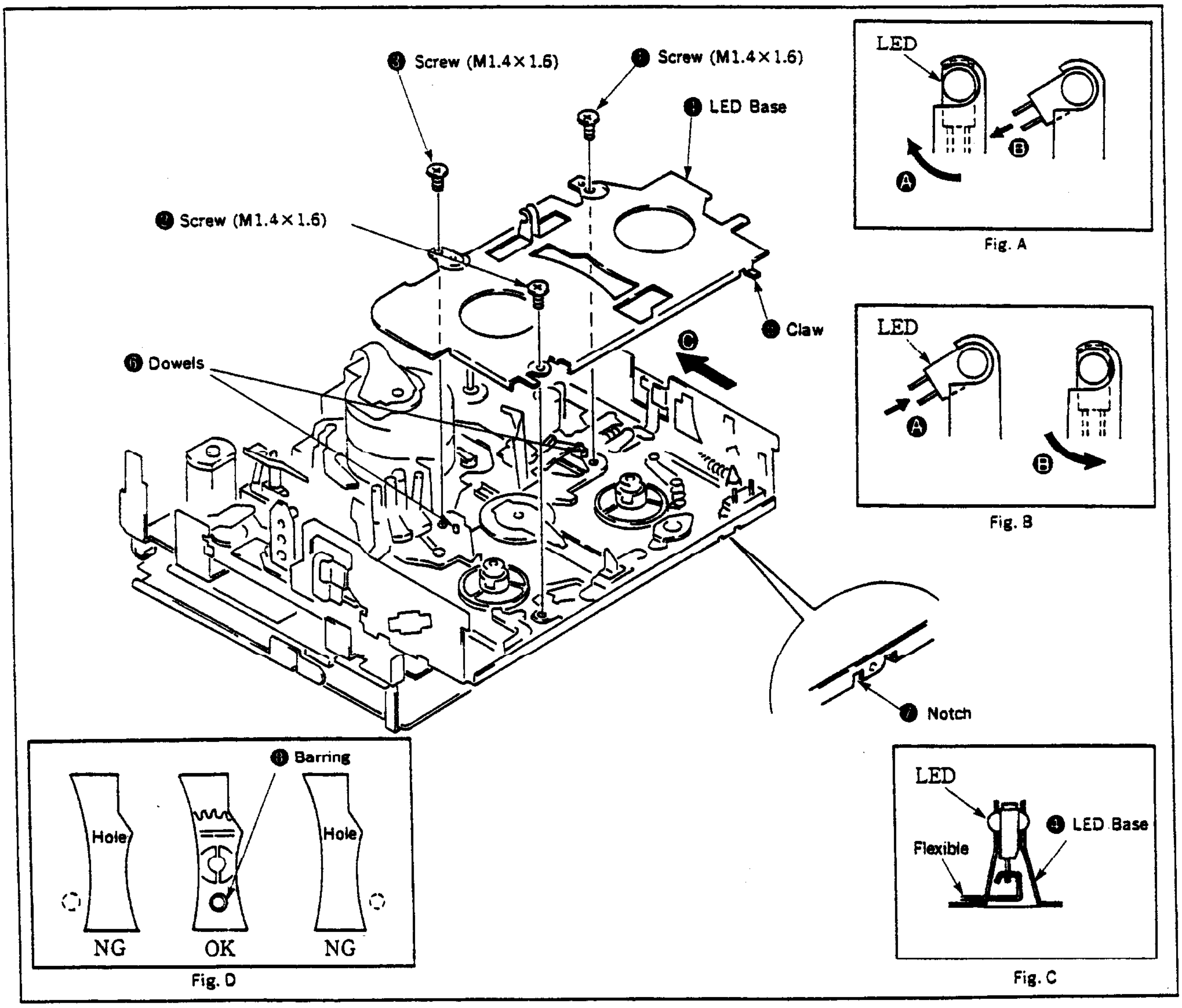

❸ Screw (M1.4×1.6)
❶ Screw (M1.4×1.6)
❹ LED Base
❷ Screw (M1.4×1.6)
❺ Claw
❻ Dowels
Ⓒ
❼ Notch
LED
Ⓐ
Ⓑ
LED
Ⓐ
Ⓑ
LED
❹ LED Base
Flexible
❽ Barring
Hole
Hole
NG
OK
NG

Fig. A

Fig. B

Fig. C

Fig. D

Fig. 8

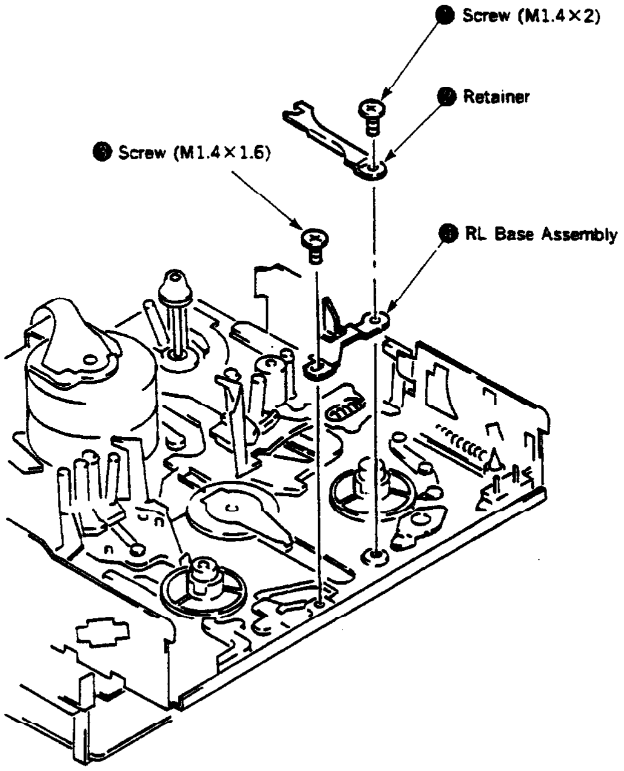
3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, retainer ●.
5) Remove the screw ●, and then, RL base assembly ●.

2. Mounting

1) Select the USE mode.
2) With the screw ●, mount the RL base assembly ● to the LS chassis.
3) With the screw ● fix the retainer ● to the RL base assembly ●.
   When this is done, align the bump part ⁎ of the retainer ● with the bump part ⁎ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.


● Screw (M1.4×2)
● Retainer
● Screw (M1.4×1.6)
● RL Base Assembly

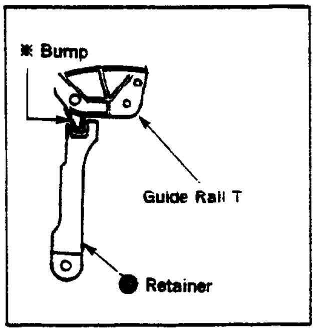

⁎ Bump
Guide Rail T
● Retainer

Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ● in the USE mode, remove the string out of the groove of the table assy, reel, supply ●. When this is done, be careful not to bend the tension regulator string ● and the S soft arm ● must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ●.

Note : Dismount and remount the table assy, reel, supply ●, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) As shown in Fig. B, move the S soft arm ● in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ●, mount the table assy, reel, supply ● to the shaft ●.
4) Put the tension regulator string ● in the groove of the table assy, reel, supply ● and fit it properly by turning the table assy, reel, supply ●.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ● with naked hand. Also, be careful of adhesion of grease, etc.

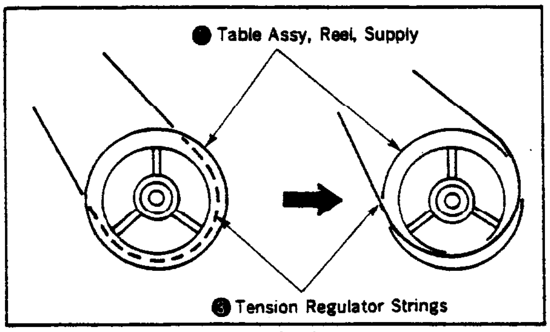

● Table Assy, Reel, Supply
● Tension Regulator Strings

Fig. A

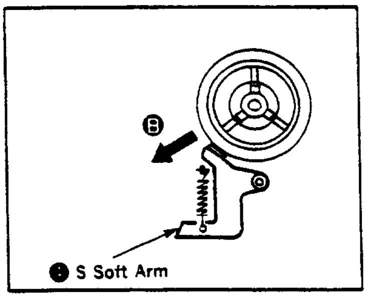


Fig. B

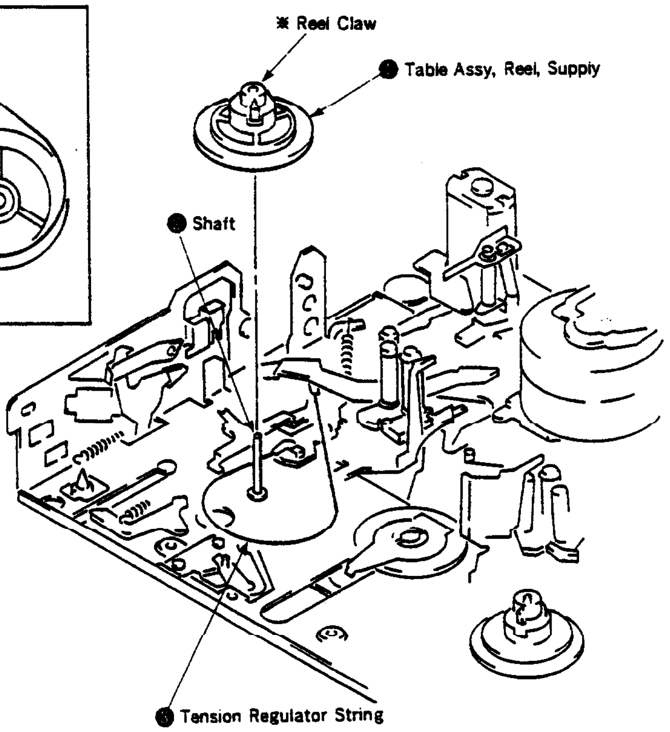

※ Reel Claw
● Table Assy, Reel, Supply
● Shaft
● Tension Regulator String

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ❶ in a direction of the arrow Ⓐ.
6) With the claw (T ratchet head) of the T ratchet ❶ moved in a direction of the arrow Ⓑ, remove the Table assy, reel, take-up ❷.

Note : Dismount and remount the Table assy, reel, take-up ❷, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ❶ moved in an arrow direction, mount the Table assy, reel, take-up ❷ to the shaft ❸.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

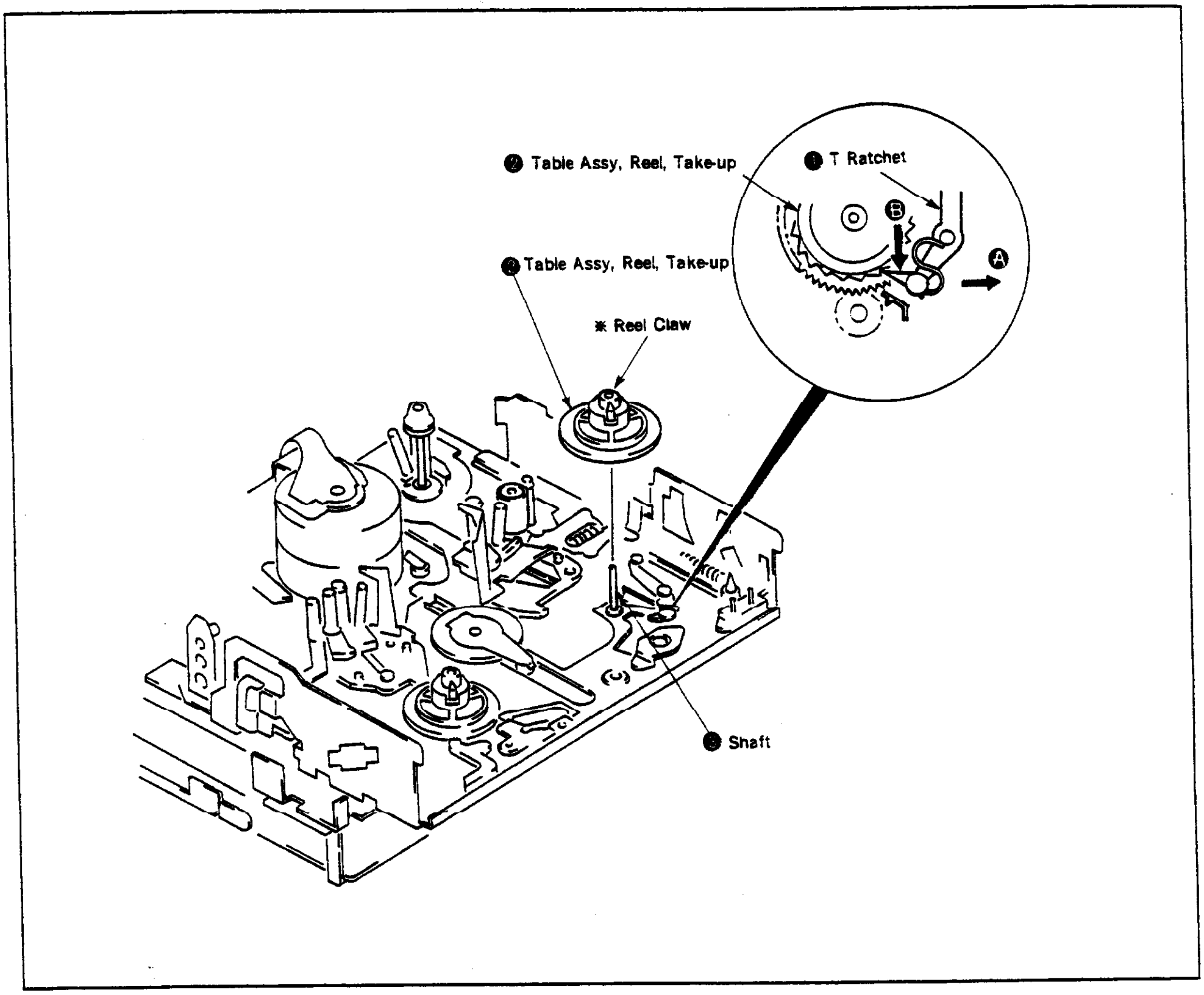


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ❶, and then, oneway clutch assembly ❷.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ❷ to the LS chassis and fix with the screw ❶.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

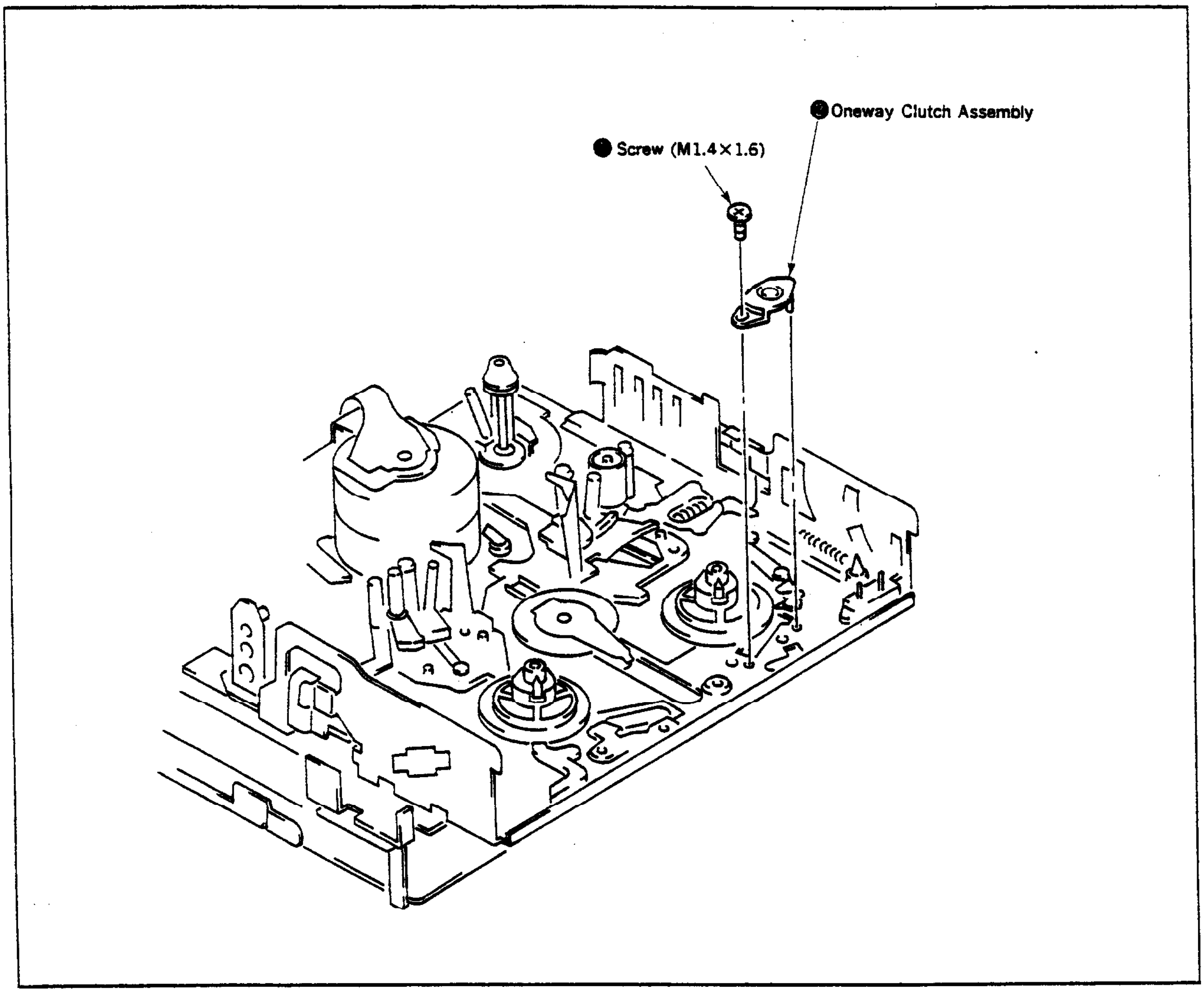


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ●, and then, the spring, tension ●.
5) Remove the S soft arm assembly ● by rotating it in an arrow direction (until the hook ● comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowindicated part of the shaft ●.
3) Mount the S soft arm assembly ● to the shaft ●, rotating it in as arrow direction. (Be careful not to bend the hook ●.)
4) Hook the spring, tension 2 onto the claw and fix it with lock washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

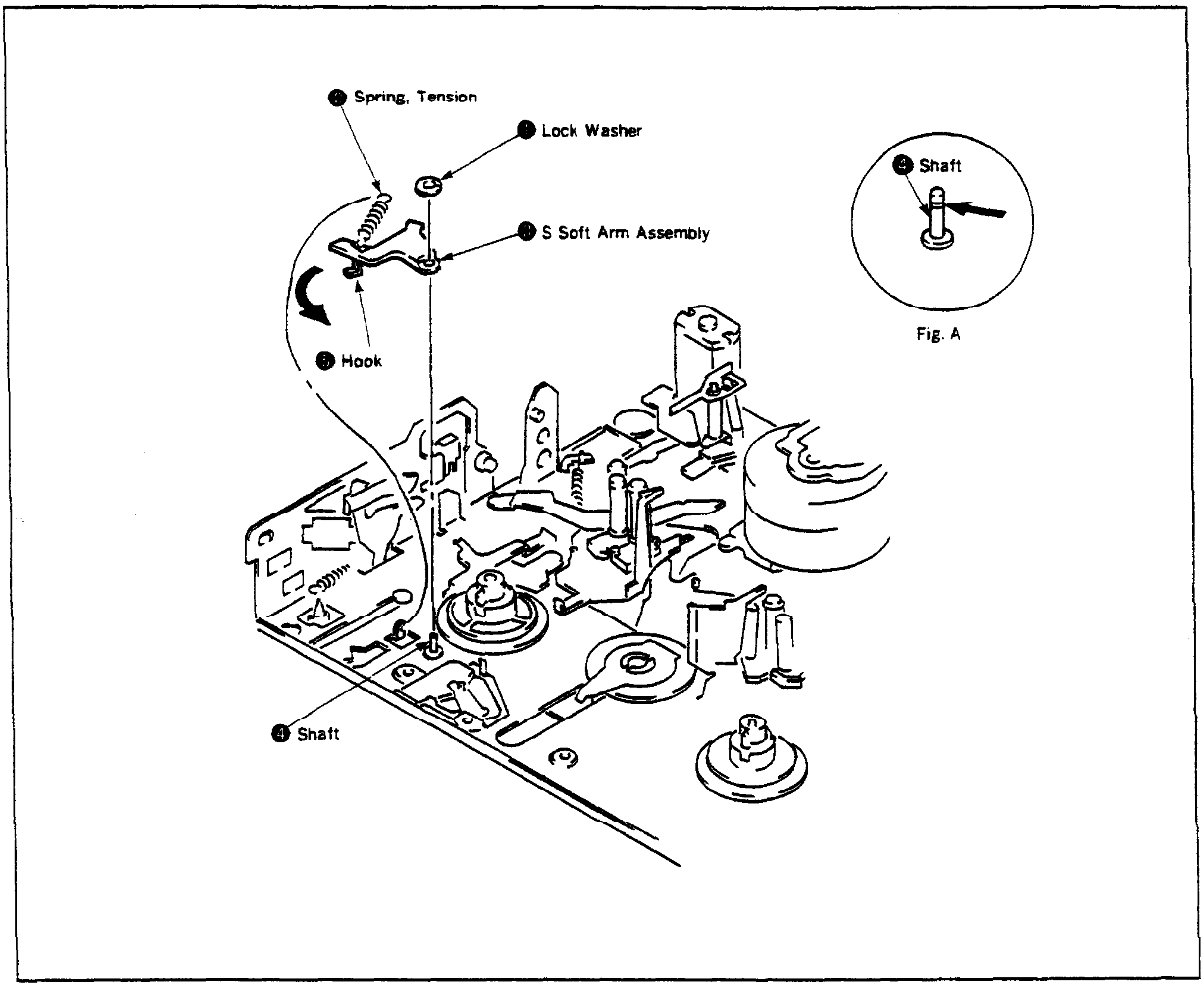


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ❶, and then, arm assy gear ❷.
6) Select the Q, REW mode.
7) Remove the flexible rotary shaft ❸, and then, the flexible connector ❹.
8) Remove the E retaining ring ❺ and three screws ❻.
9) Remove the LS chassis assembly ❼ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ❼.
2) Unload in the RDY mode. Start docking in the Q, REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ❼, it is necessary to place the following parts at specified positions.
3) Put the pin ●of the pinch arm assembly ●into the left side of the pinch press arm assembly●. (Fig.19)
4) Move the TG-1 arm assembly●in a direction of the arrow Ⓐ to put the pin ●into the concave of the arm assembly ●. (Fig. 17)
5) put the pin●of the S ratchet●into the right side the of the arm assembly●. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ❽ With the arm arc portion of the guide arm T assembly● (Fig. 15) to push the LS chassis assembly ❼ in a direction of the arrow Ⓔ, and at the same time, engage the claws of the guide rail base 1●, guide rail base 2●and guide rail base3●with those of the guide rail S● and guide rail T●. (Fig. 16)

Then, align the shafts ❾ of the mechanical chassis With the four long joints of the LS chassis assembly ❼, and put the LS pin●of the LS arm assembly●in the groove of the LS cam plate●. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ❺ and three screws ❻.
7) Mount the flexible rotary shaft ❸ and flexible connector ❹.
8) Select the USE mode.
9) Mount the arm assy gear ❷ and fix with the lock washer ❶.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

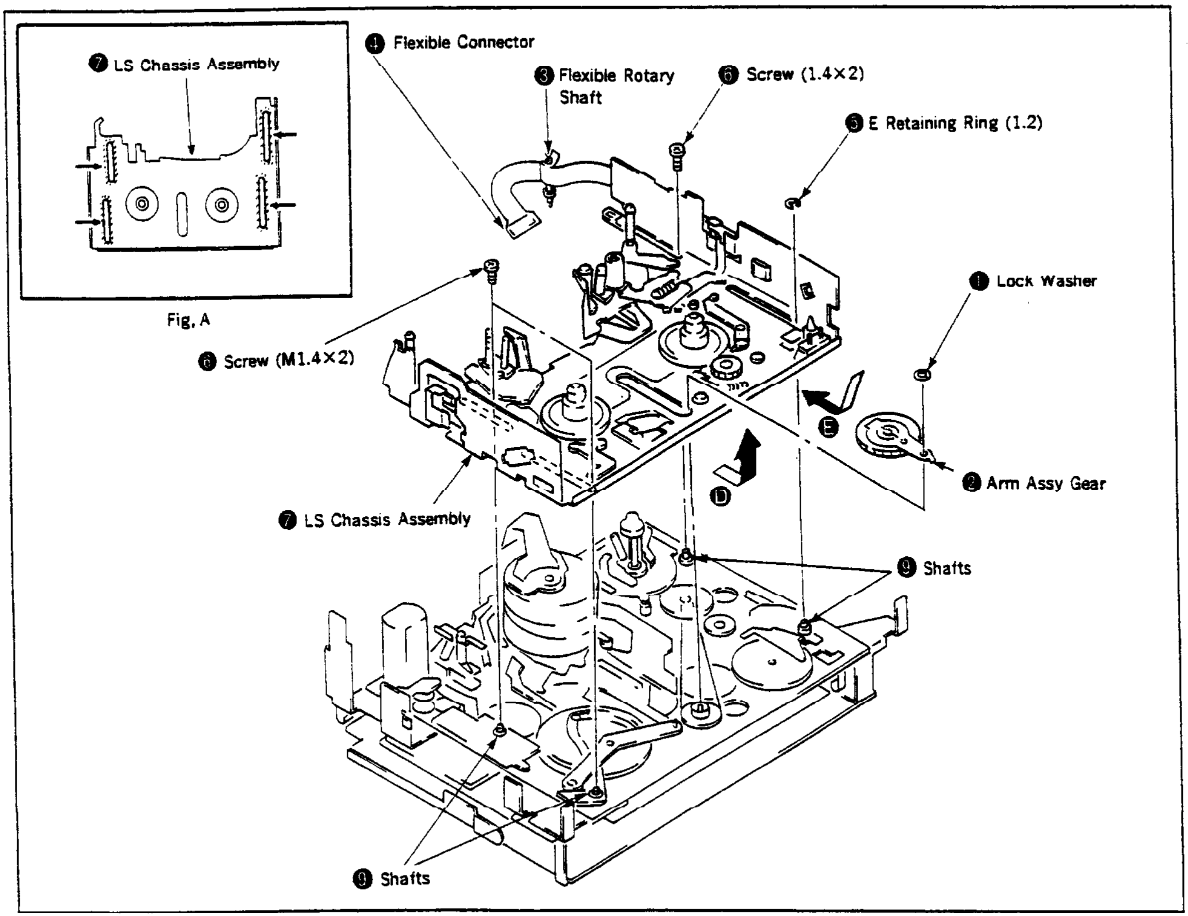


Fig. 14

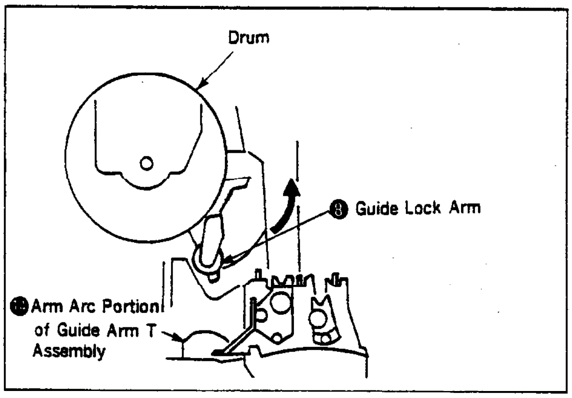

Drum
Guide Lock Arm
Arm Arc Portion of Guide Arm T Assembly

Fig. 15

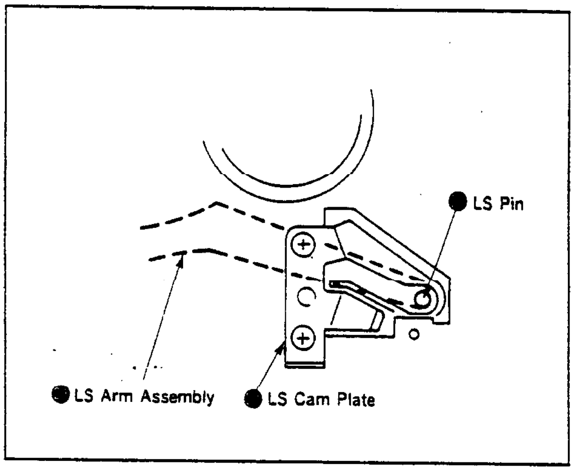

LS Pin
LS Arm Assembly
LS Cam Plate

Fig. 18

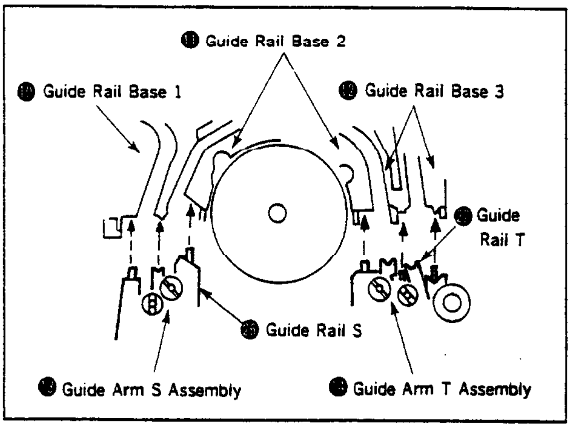

Guide Rail Base 2
Guide Rail Base 1
Guide Rail Base 3
Guide Rail T
Guide Rail S
Guide Arm S Assembly
Guide Arm T Assembly

Fig. 16

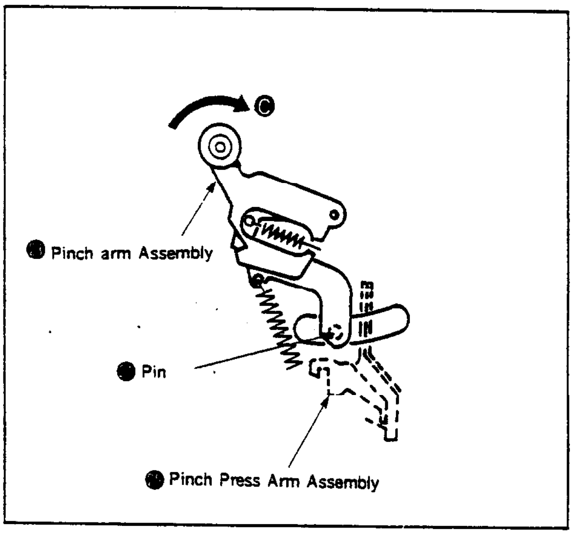

C
Pinch arm Assembly
Pin
Pinch Press Arm Assembly

Fig. 19

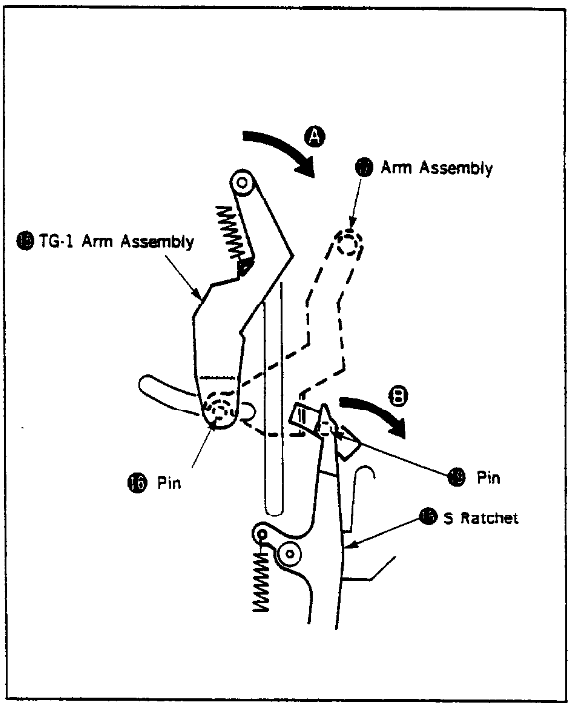

A
Arm Assembly
TG-1 Arm Assembly
B
Pin
Pin
S Ratchet

Fig. 17

-8 PINCH ARM ASSEMBLY (Fig. 20)

.. Removal

) Referring to 1-1, remove the cassette compartment holder assembly.

) Referring to 3-7, remove the LS chassis assembly.

) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.

) Remove the spring, tension ❸, and then, pinch arm assembly ❹.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❺ over one third of a drip up to half a drip.
2) put the rotation center of the pinch arm assembly in the boss ❺ hole, and the pin ❻ in the long hole.
3) Hook the spring, tension ❸ onto the upper groove of the pinch return spring shaft ❼.
4) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

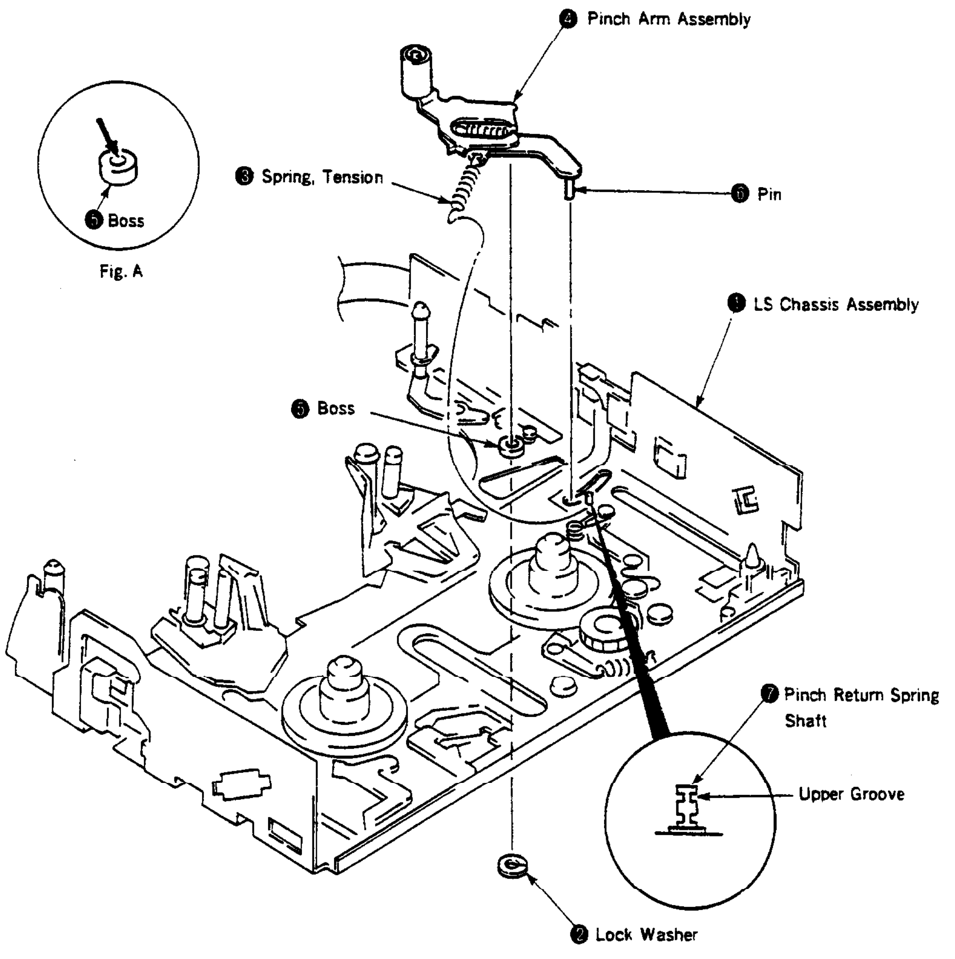

❹ Pinch Arm Assembly
❸ Spring, Tension
❻ Pin
❺ Boss
Fig. A
❶ LS Chassis Assembly
❺ Boss
❼ Pinch Return Spring Shaft
Upper Groove
❷ Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

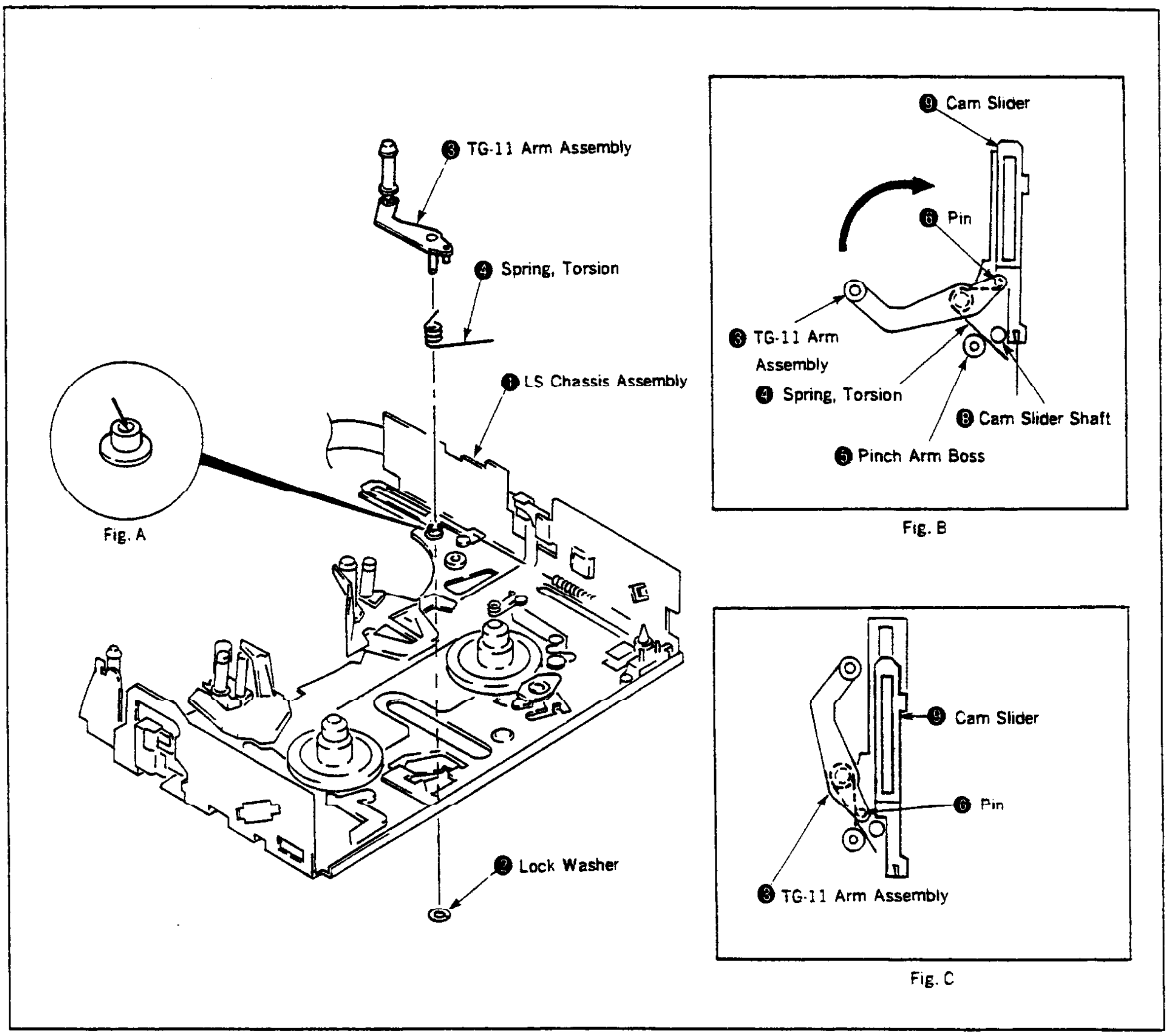

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly

Fig. A

Fig. B

Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28, adjust a FWD back tension.

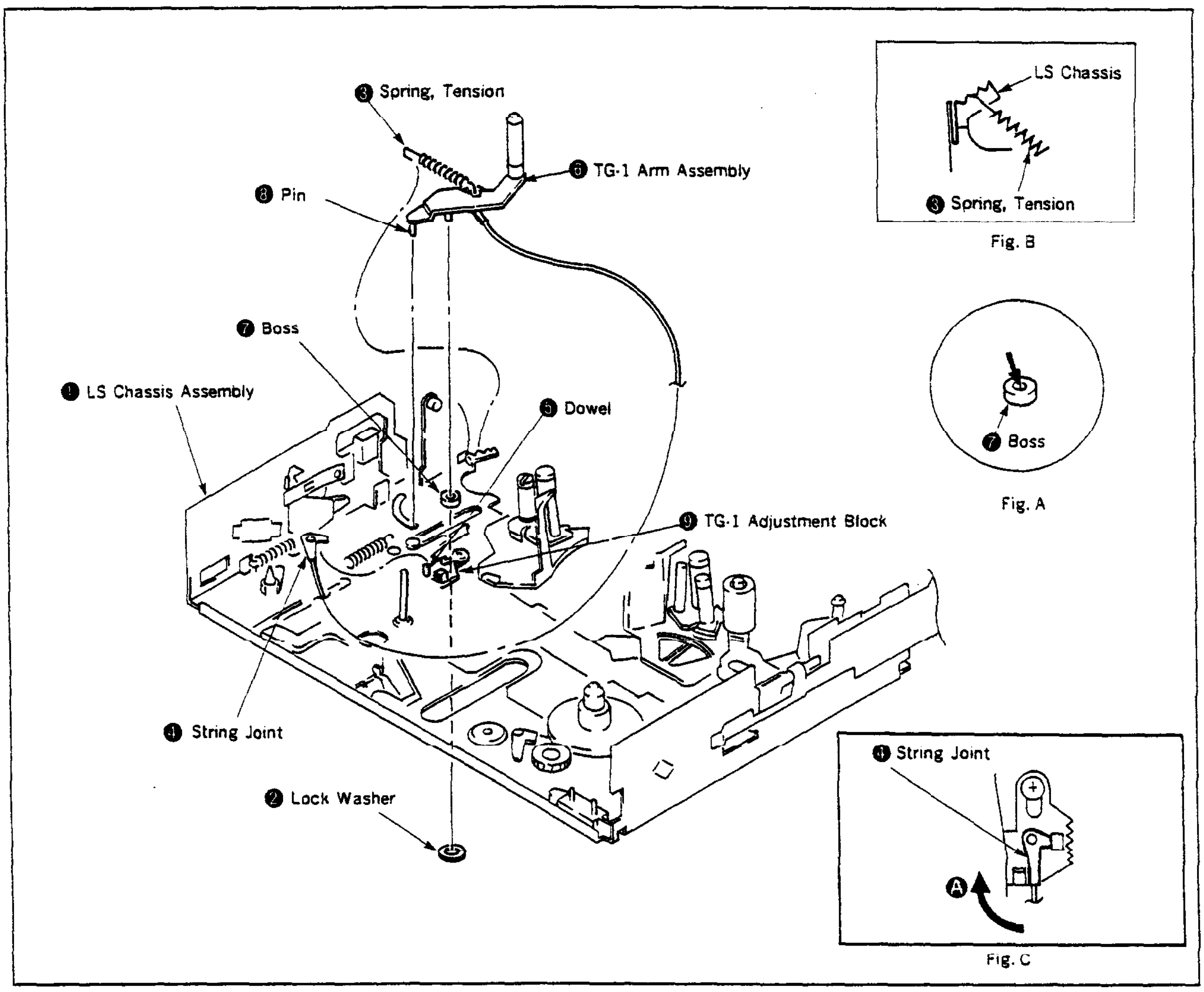

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
Fig. B
❼ Boss
Fig. A
❹ String Joint
Ⓐ
Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ✱.

Note : The joint holder ❷, which was removed once, must not be used again.

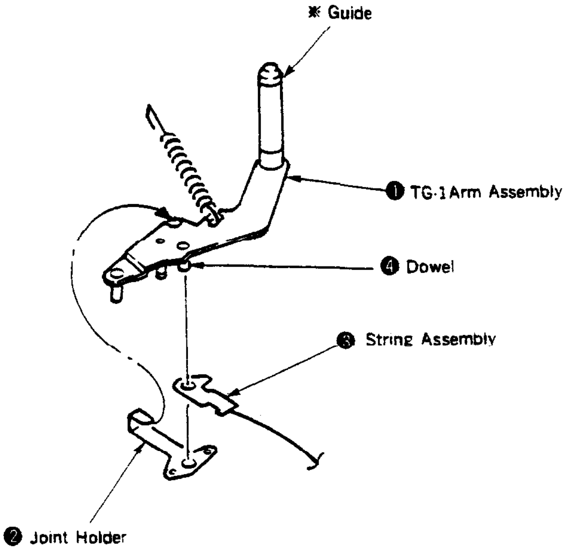

✱ Guide
❶ TG-1 Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove *the LS chassis assembly.*
3) Rotate the guide arm T assembly ❶ and guide arm S assembly in arrow directions respectively, align their shafts ❸ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ✱. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the *arrows respectively.*
2) Fit the TG-7 base assembly ❺ and TG-9 base assembly ❻ in the grooves of the guide rail T ❹. (Fig. 25)
3) Put the shaft ❸ flange in the long groove of the guide rail S ❽, and fit the TG-4 base assembly ❾ and TG-6 base assembly ❿ into the right and left grooves of the guide rail S ❽ respectively.
   When this is done, see to it that the flat spring of the TG-6 base assembly❿ is located below the guide rail S ❽ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

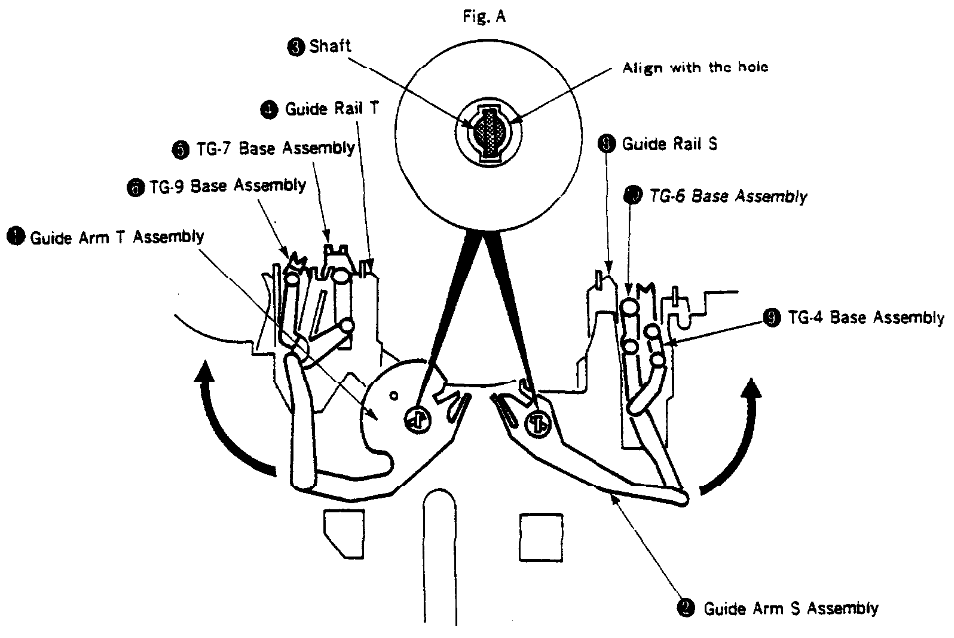


Fig. A
❸ Shaft
Align with the hole
❹ Guide Rail T
❺ TG-7 Base Assembly
❽ Guide Rail S
❻ TG-9 Base Assembly
❿ TG-6 Base Assembly
❶ Guide Arm T Assembly
❾ TG-4 Base Assembly
❷ Guide Arm S Assembly

LS Chassis Assembly Viewed from Back

Fig. 24

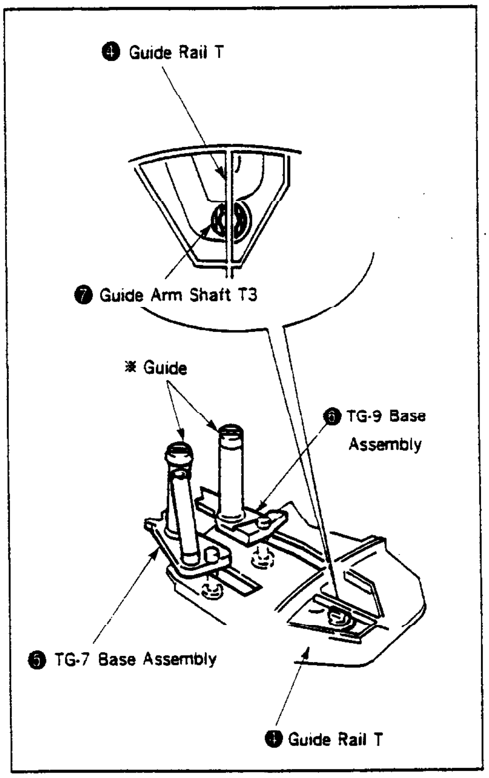

④ Guide Rail T
⑦ Guide Arm Shaft T3
※ Guide
⑥ TG-9 Base Assembly
⑤ TG-7 Base Assembly
④ Guide Rail T

Fig. 25

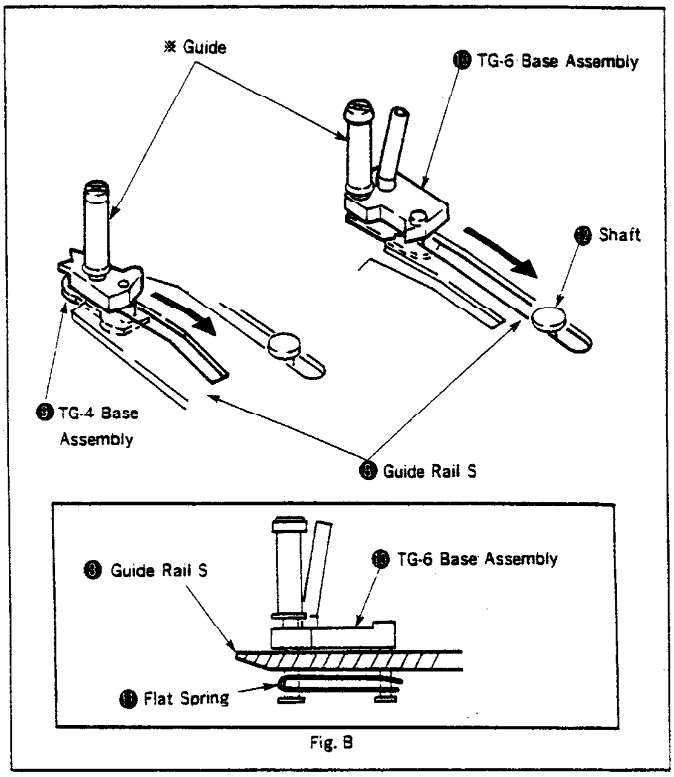

※ Guide
⑩ TG-6 Base Assembly
⑫ Shaft
⑨ TG-4 Base Assembly
⑧ Guide Rail S
⑧ Guide Rail S
⑩ TG-6 Base Assembly
⑪ Flat Spring
Fig. B

Fig. 26

13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Remove the screw ❶, and then, pinch press arm assembly ❷.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ❷ at 3 places.
3) Put the pin ❹ of the pinch press arm assembly ❷ in the groove of the cam B ❸.
4) Fix. with the screw ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

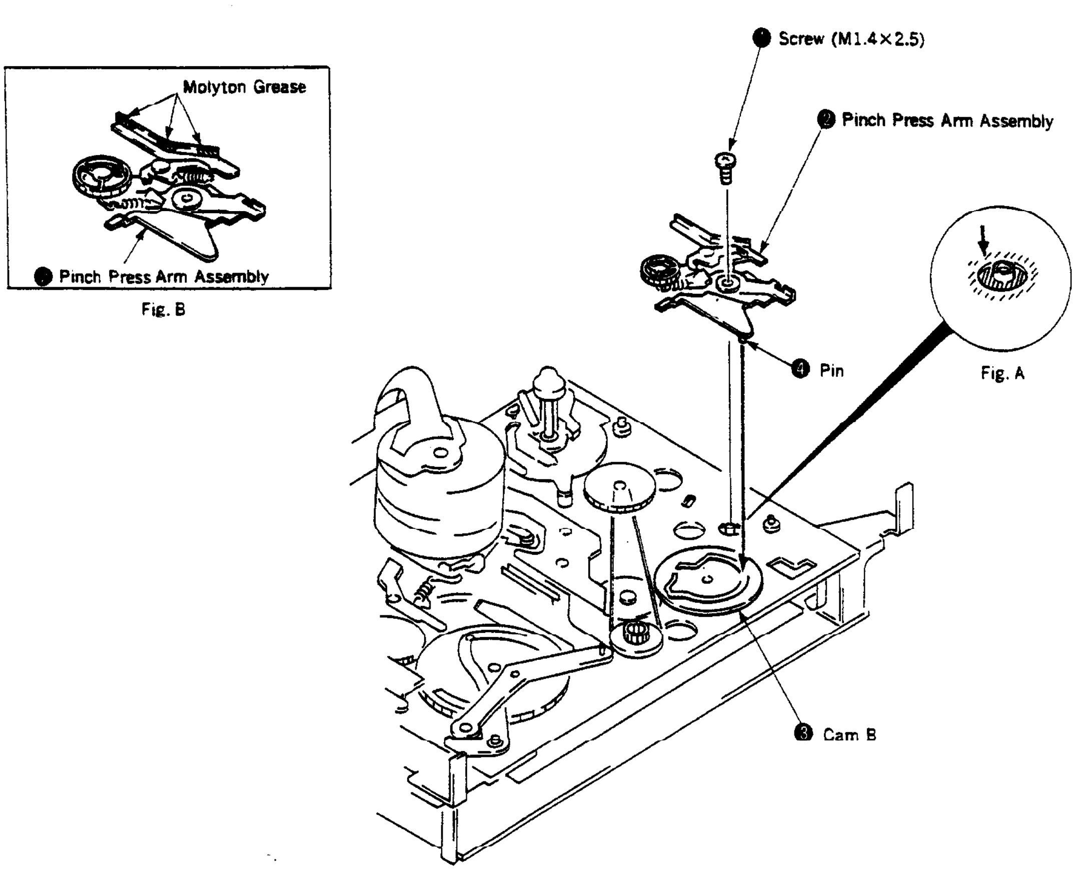

Molyton Grease
❷ Pinch Press Arm Assembly
Fig. B
❶ Screw (M1.4×2.5)
❷ Pinch Press Arm Assembly
❹ Pin
Fig. A
❸ Cam B

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the qroove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ⁕ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

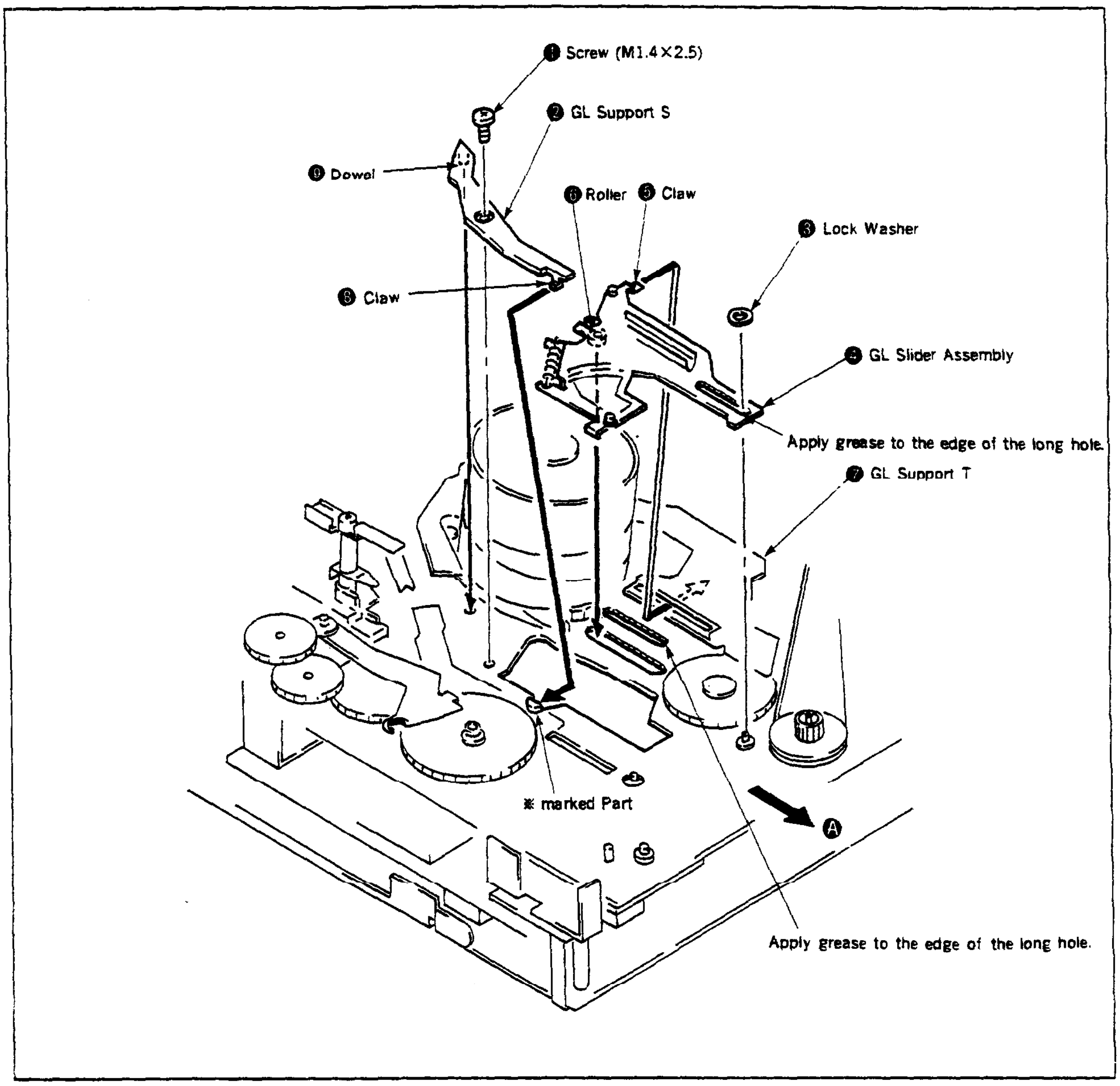

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
⁕ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

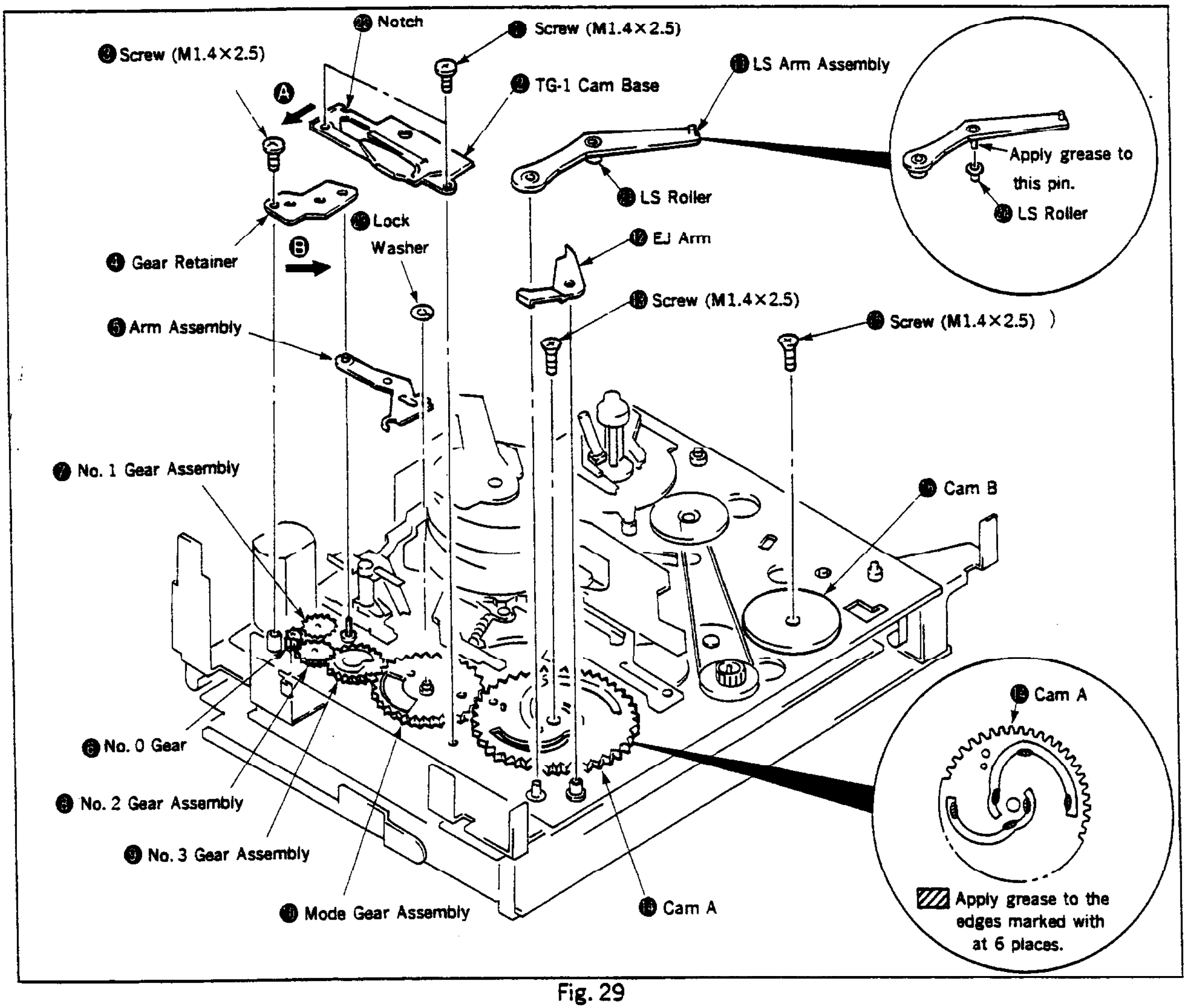
3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ①, and remove the TG-1 cam base ② by moving it in a direction of the arrowⒶ. (Remove the notch ●from the groove of the No. 3 gear shaft.)
4) Remove the screw ③, and remove the gear retainer ④ by sliding it in a direction of the arrowⒷ.
5) Remove the arm assembly ⑤, No. 0 gear ⑥, No. 1 gear assembly ⑦, No. 2 gear assembly ⑧, No. 3 gear assembly ⑨, lock washer●, and then, mode gear assembly●, respectively.
6) Being careful not to lose the LS roller●of the LS arm, remove the LS arm assembly●and EJ arm⑫, respectively.
7) Remove the screw⑬, and then, cam A●.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw●, and then, cam B●.

2. Adjustment and Mounting

1) Face the holeⓐ of the mode gear assembly●to a direction of the arrowⒶ, move the GL slider assembly●in a direction of the arrowⒷ, apply molyton grease to the pin of the GL slider assembly●, and mount the LS roller●. (Fig. 30)
2) Set a direction of the cam A●so that the holeⓒ of the cam A ●will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider●so that the LS roller●will be placed into the grooveⓓ of the cam A●. At the same time, engage the mode gear assembly●with the gear of the relay gear A●, and mount the cam A●. Insert a stick of about ϕ1.5mm in the hole ⓒ of the cam A●. (Fig. 31)
4) Align the holeⓔ of the cam B●with the hoie of the mechanical chassis. At the same time, engage the relay gear B● with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the holeⓕ of the No. 3 gear assembly ⑨ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly●with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ⑧, No. 1 gear assembly ⑦ and No. 0 gear ⑥ in that order. Mount the arm assembly ⑤ to the shaft and put the pin●in the groove of the No. 3 gear assembly ⑨, (Fig. 34)
8) Put the TG-1 cam base ② in place, fit the notch●to the shaft and shift it in an arrow direction, and mount the screws ● and ●in that order. (Fig. 35)
9) Put the gear retainer ④ in place, slide it in an arrow direction and fix it with the screw ③. (Fig. 36)
10) Seeing to it that the EJ arm⑫and the LS roller●of the LS arm assembly●are put in the grooveⓖ of the cam A●, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.



● Notch
① Screw (M1.4×2.5)
③ Screw (M1.4×2.5)
Ⓐ
② TG-1 Cam Base
● LS Arm Assembly
Apply grease to this pin.
● LS Roller
● LS Roller
● Lock Washer
④ Gear Retainer
Ⓑ
⑫ EJ Arm
⑬ Screw (M1.4×2.5)
● Screw (M1.4×2.5))
⑤ Arm Assembly
⑦ No. 1 Gear Assembly
● Cam B
● Cam A
⑥ No. 0 Gear
⑧ No. 2 Gear Assembly
⑨ No. 3 Gear Assembly
● Mode Gear Assembly
● Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

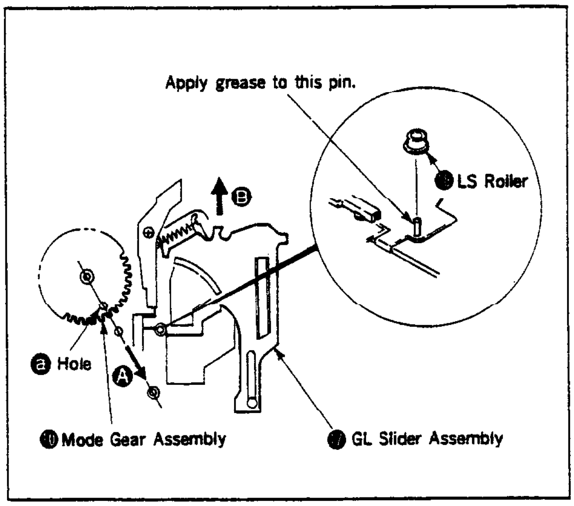

Apply grease to this pin.
⑱ LS Roller
Ⓑ
ⓐ Hole
Ⓐ
⑱ Mode Gear Assembly
⑰ GL Slider Assembly

Fig. 30

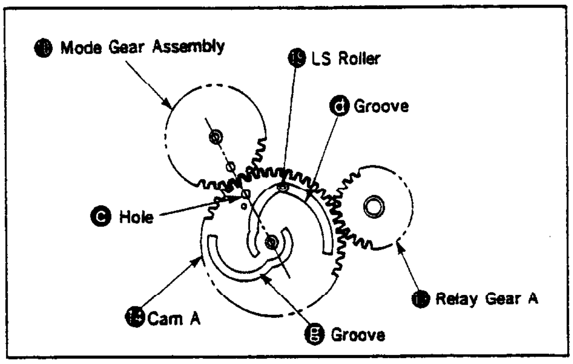

⑱ Mode Gear Assembly
⑲ LS Roller
ⓓ Groove
ⓒ Hole
⑭ Cam A
ⓑ Groove
⑮ Relay Gear A

Fig. 31

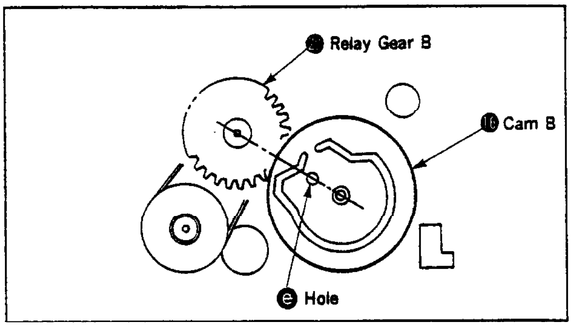

⑳ Relay Gear B
⑯ Cam B
ⓔ Hole

Fig. 32

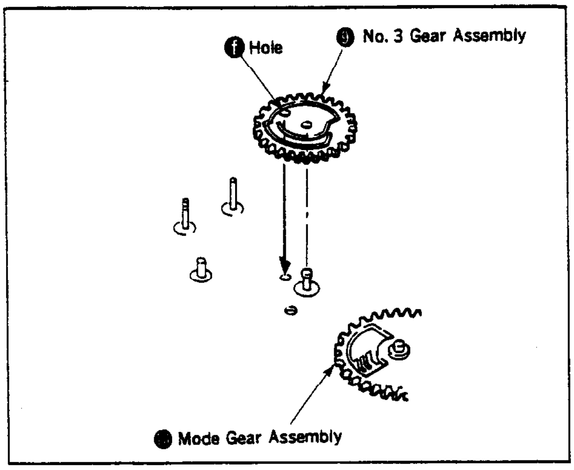

ⓕ Hole
⑨ No. 3 Gear Assembly
⑱ Mode Gear Assembly

Fig. 33

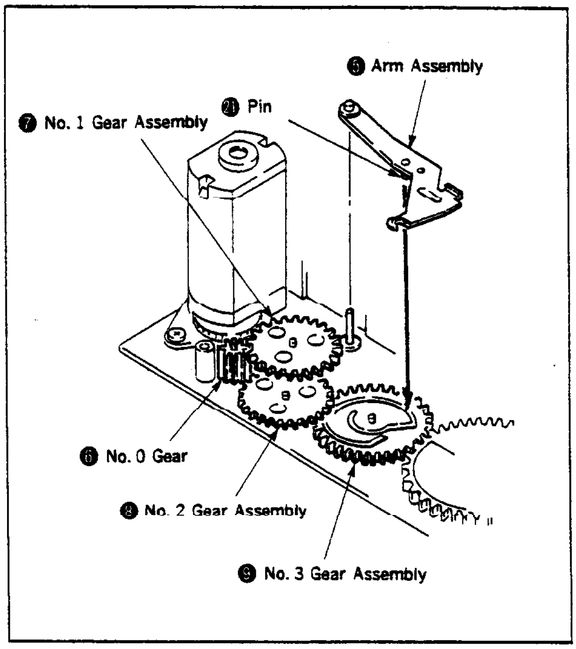

⑤ Arm Assembly
㉑ Pin
⑦ No. 1 Gear Assembly
⑥ No. 0 Gear
⑧ No. 2 Gear Assembly
⑨ No. 3 Gear Assembly

Fig. 34

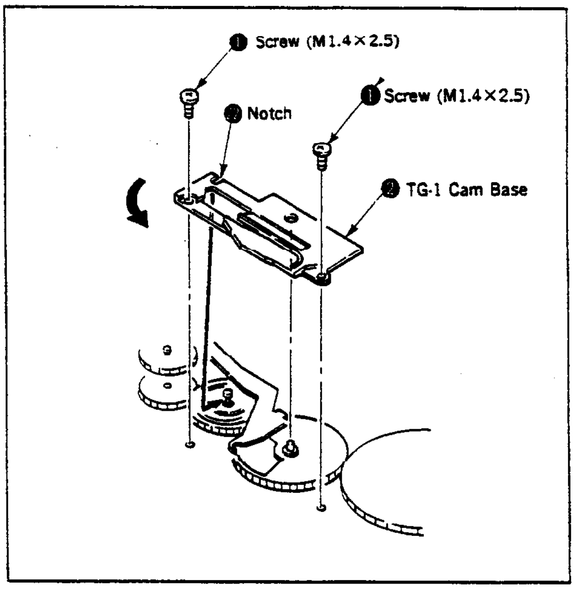

① Screw (M1.4×2.5)
ⓖ Notch
① Screw (M1.4×2.5)
② TG-1 Cam Base

Fig. 35

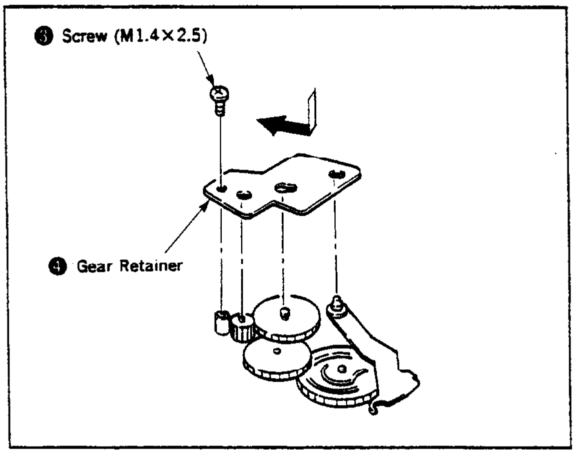

③ Screw (M1.4×2.5)
④ Gear Retainer

Fig. 36

.6 GEAR TRAIN OPERATION CHECK (Fig. 37)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Referring to 3-17, remove the loading motor.

Check

Insert the tip of tweezers into the hole a of the cam A ❶.

Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.

When this is done, check that each, gear, the CL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.

4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

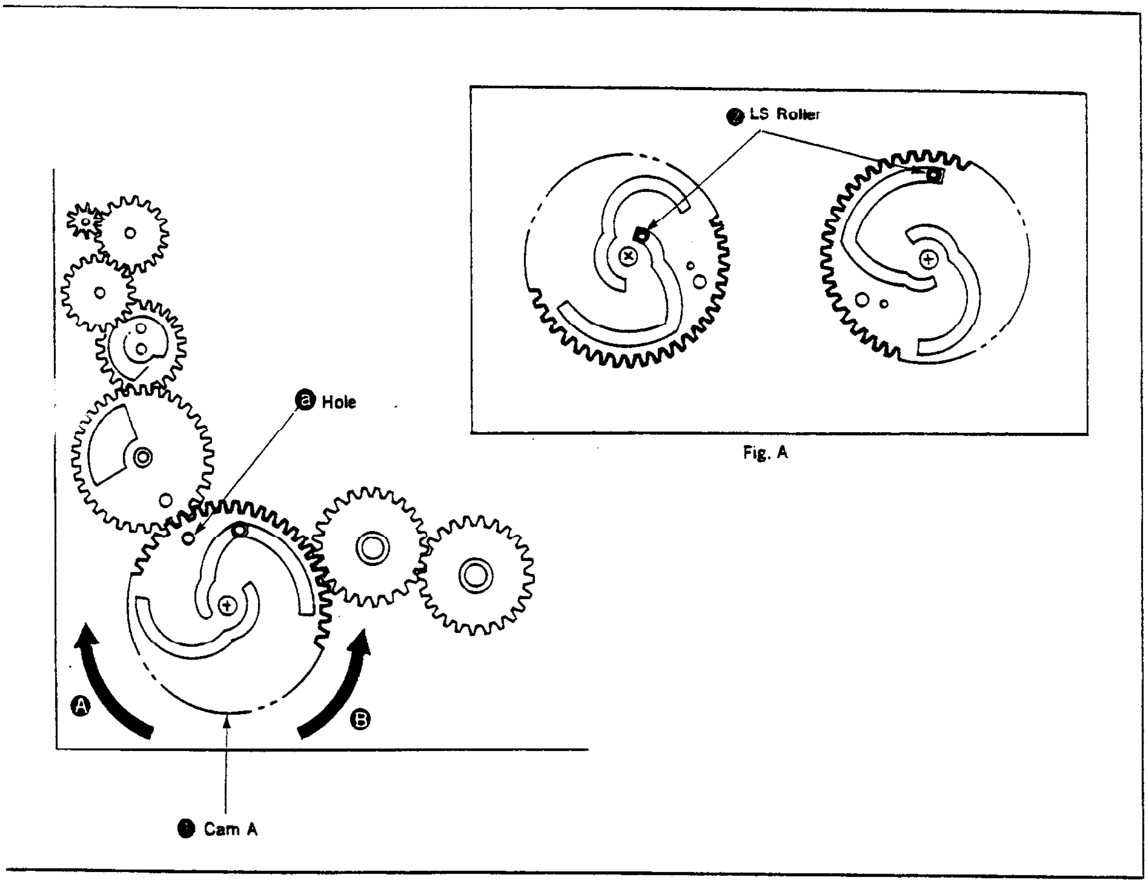


Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

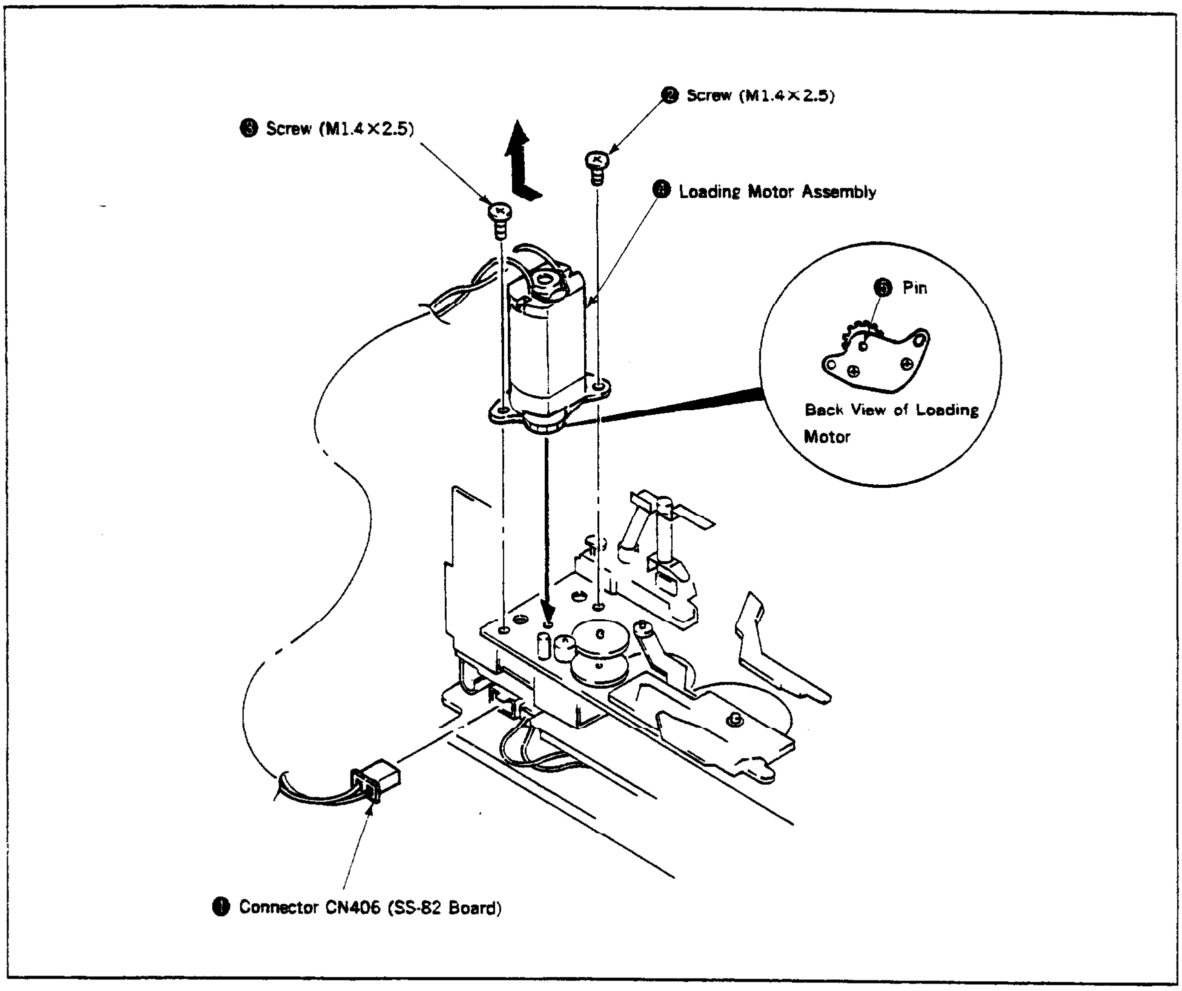

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ●, and then, guide rail base 1 assembly ●.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ●. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ● of the guide rail base 1 assembly ● in the notch of the chassis, and tighten the two screws ● with a torgue of 0.6kg•cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ● with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

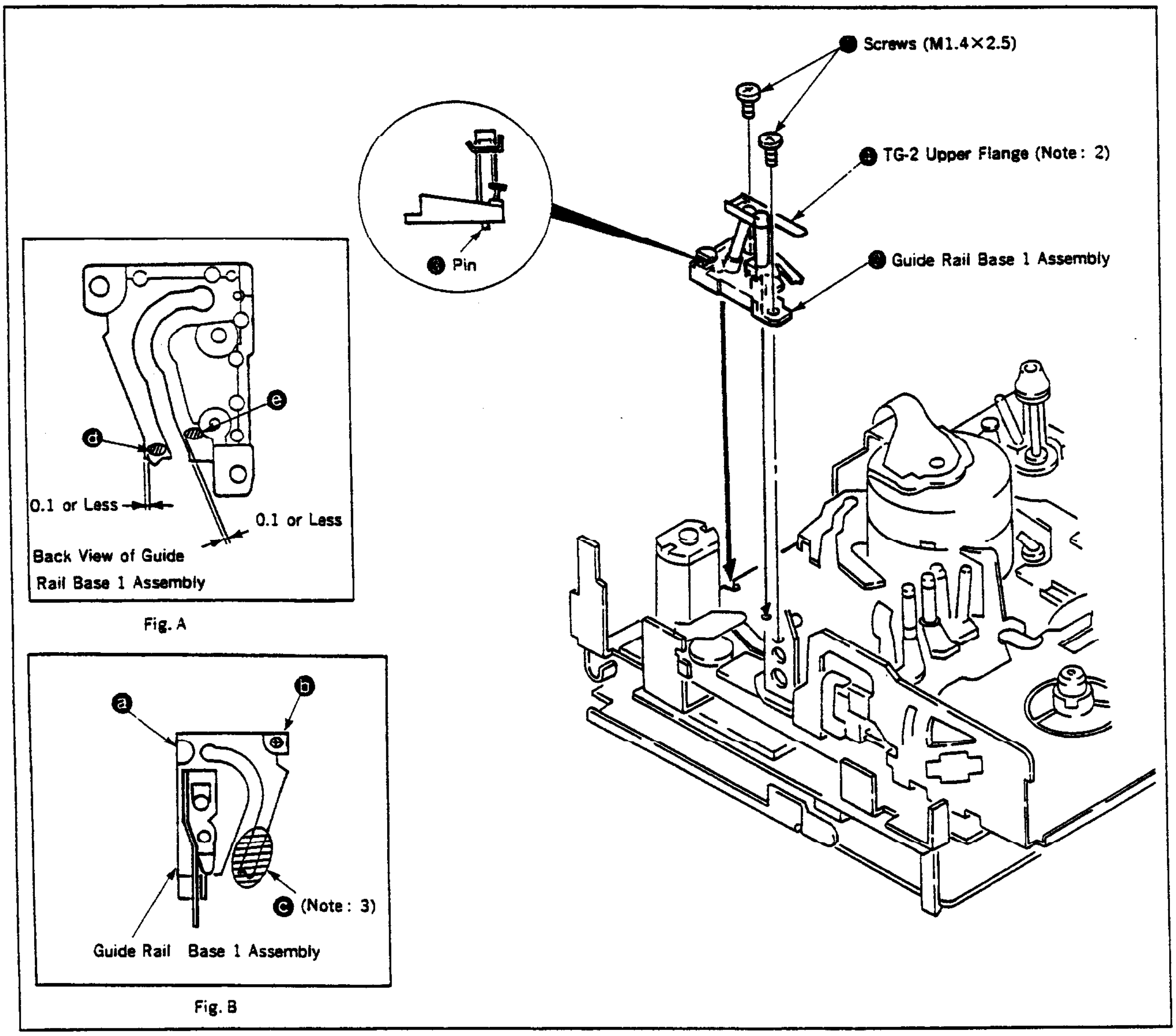

● Screws (M1.4×2.5)
● TG-2 Upper Flange (Note: 2)
● Guide Rail Base 1 Assembly
● Pin
ⓓ
ⓔ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
ⓐ
ⓑ
ⓒ (Note: 3)
Guide Rail Base 1 Assembly

Fig. A

Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ●, and then, frame B assembly ● in a direction of the arrowⒶ.
4) Unskate the LS chassis a little.
5) Remove the two screws ●, and then, guide rail base 2 assembly ● in a direction of the arrowⒷ.

Note : Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ● to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ⁕ of the guide rail base 2 assembly ● lightly in a direction of ⓔ (Fig. B), tighten the two screws ● with a torque of 0.8kg•cm.

Note : Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ●.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

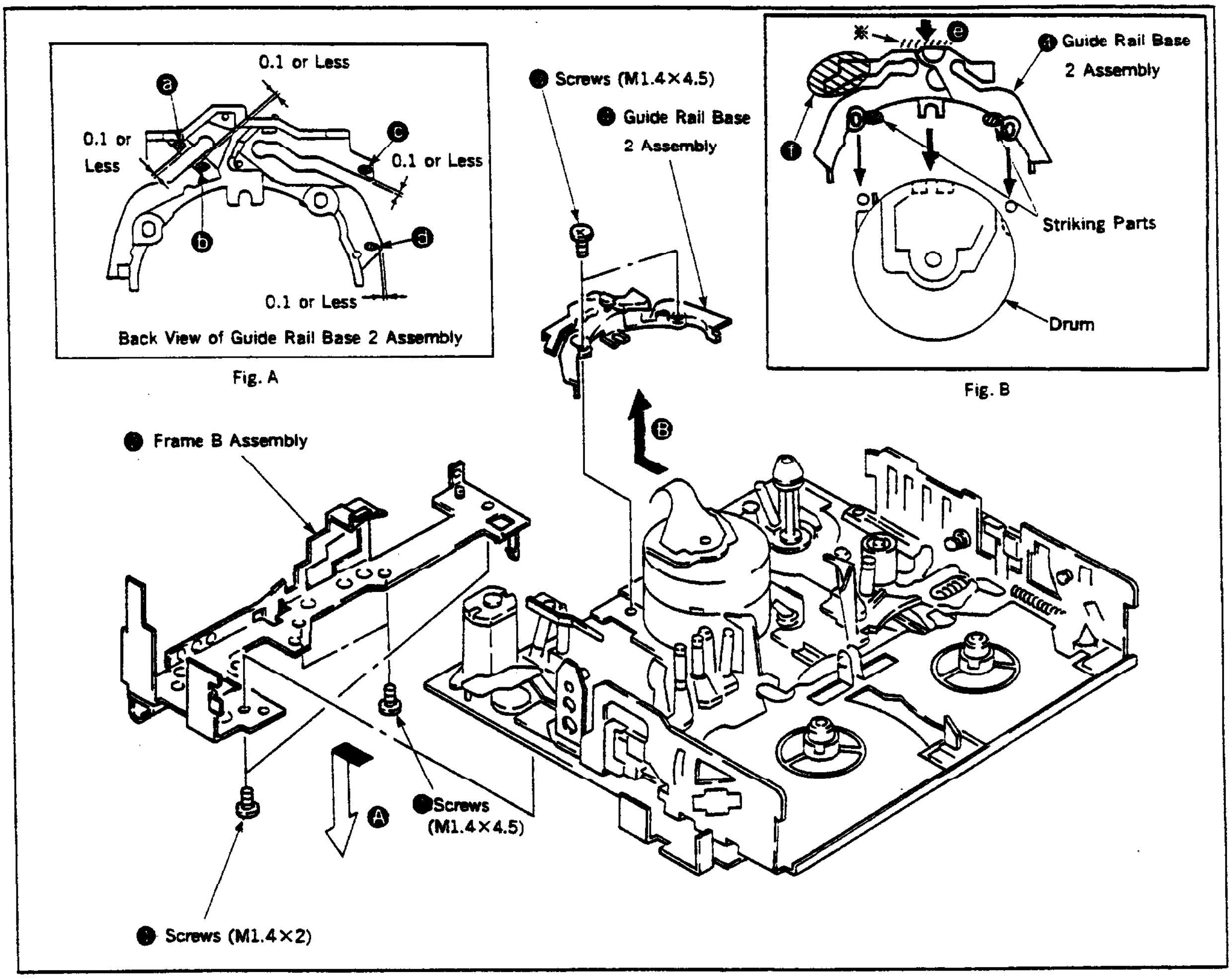

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
● Screws (M1.4×4.5)
● Guide Rail Base 2 Assembly
⁕
ⓔ
● Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Ⓑ
● Frame B Assembly
Ⓐ
●Screws (M1.4×4.5)
● Screws (M1.4×2)

Fig. A

Fig. B

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ❸.
3) Remove the two screws ❶. Remove the guide rail base 3 assembly ❷ in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ✱ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ❷. (Fig. A)
2) Mount the guide rail base 3 assembly ❷, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ❶ with a torque of 0.6kg•cm.
4) Mount the flexible rotary shaft ❸.
5) Referring to 1-1, mount the cassette compartment holder assembly.

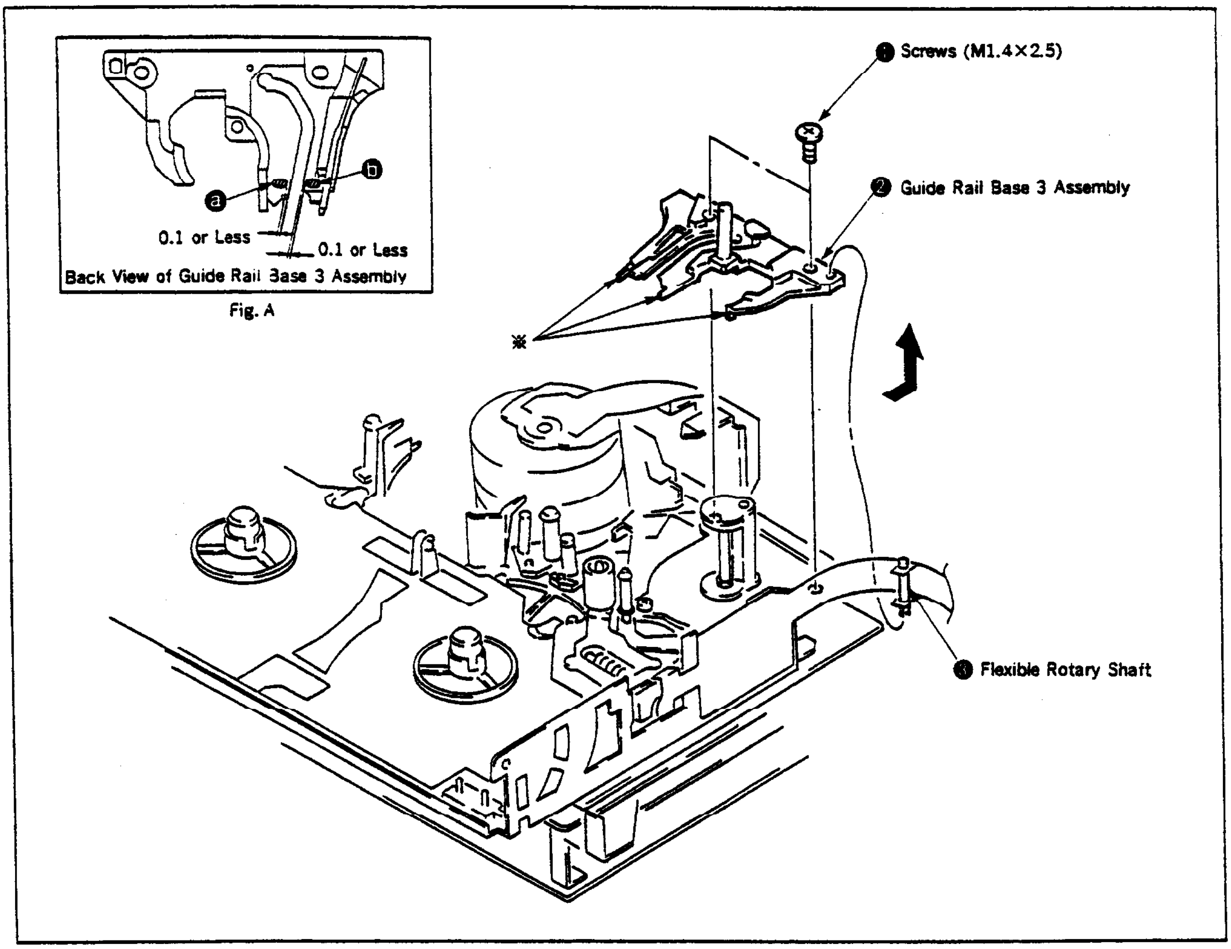

ⓐ
ⓑ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
❶ Screws (M1.4×2.5)
❷ Guide Rail Base 3 Assembly
✱
❸ Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ● of the capstan motor assembly ●.
4) Remove the screw ●. Disengaging the gear of the conversion gear assembly ●, remove the capstan motor assembly ● in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ● to engage the gear of the capstan motor assembly ● with that of the conversion gear assembly ●, and tighten the screw 3 with a torque of 1kg•cm.
   When this is done, be careful not to damage the gear of the conversion gear assembly ●.
2) Mount the connector 2 to the capstan motor assembly ●.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

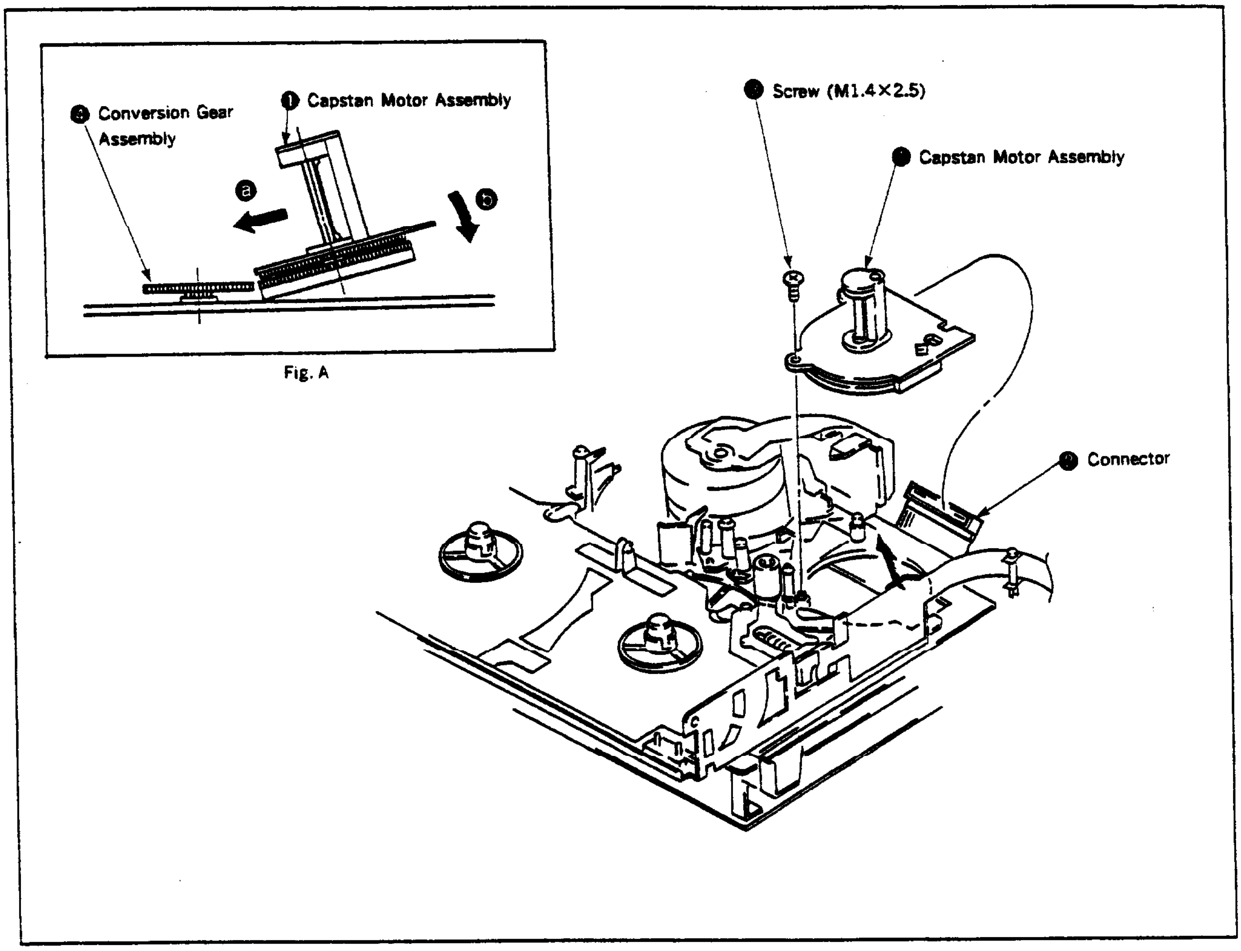

● Conversion Gear Assembly
● Capstan Motor Assembly
ⓐ
ⓑ
Fig. A
● Screw (M1.4×2.5)
● Capstan Motor Assembly
● Connector

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ●.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis and put the positioning pins ● of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ● with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

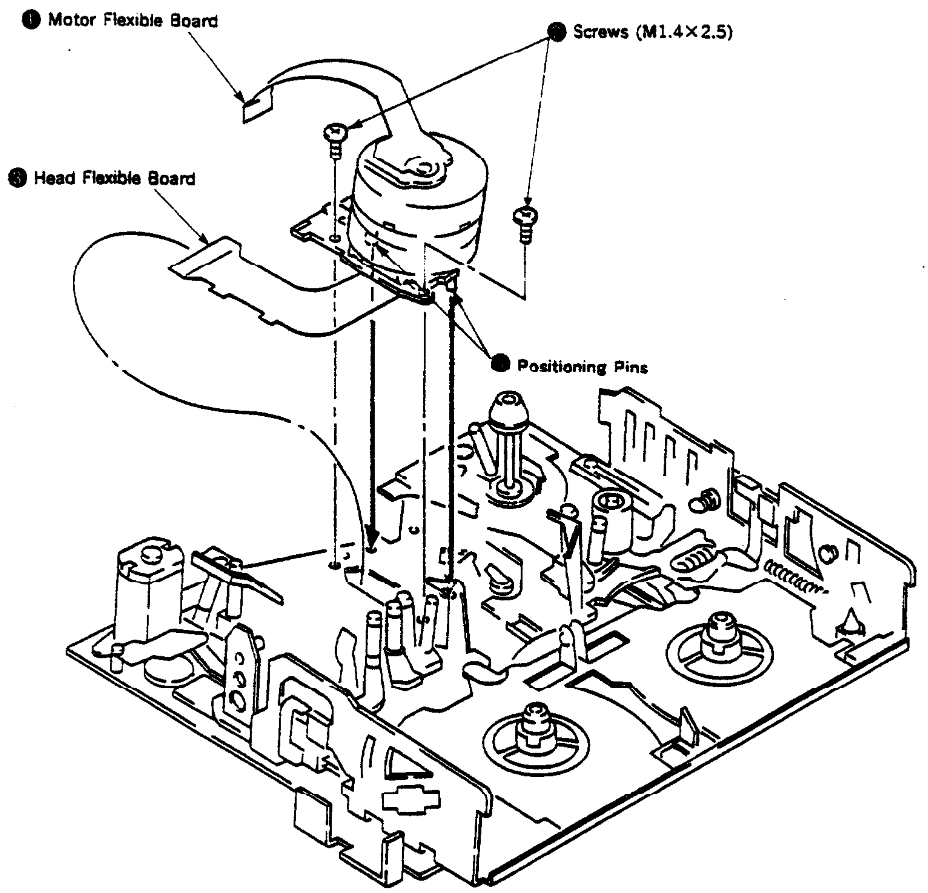


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ❷ from the back of the mechanical chassis.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ❹.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ❷ with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

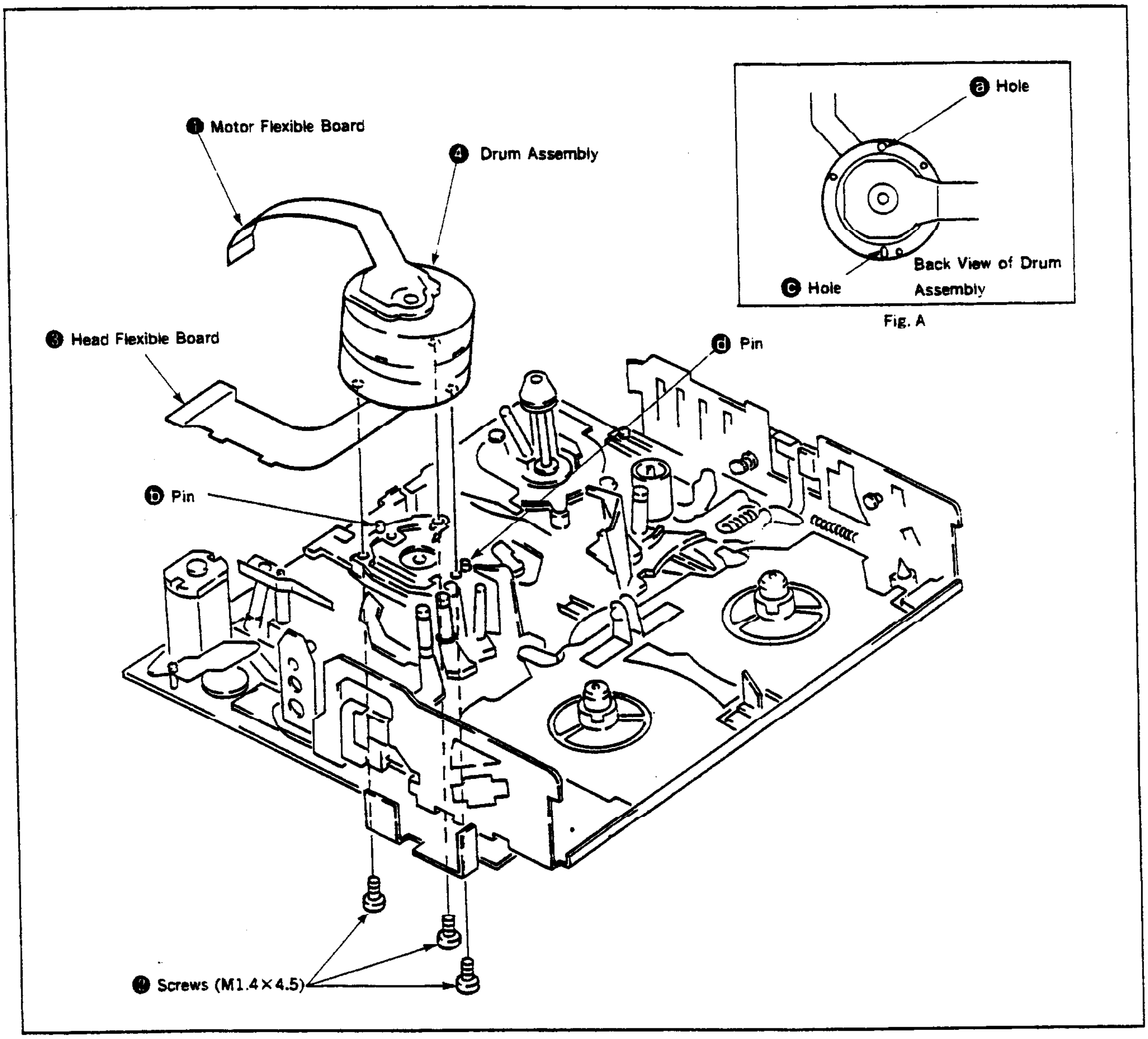
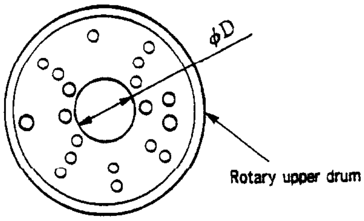

ⓐ Hole
❶ Motor Flexible Board
❹ Drum Assembly
Back View of Drum Assembly
ⓒ Hole
Fig. A
❸ Head Flexible Board
ⓓ Pin
ⓑ Pin
❷ Screws (M1.4×4.5)

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC:

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL:

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

➡

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ●. (Fig. 44)
3) Hold the outlet (base) of the guide protector ●, lift it up obliquely. In that state, hold the outer figure of the back yoke ● and remove it. (Fig. 44)

Note : Note that the flexible board and guide protector ● easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ● around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotary upper drum assembly ●. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotor ●. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface● and the surface of the rotary upper drum assembly ● which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin● will be put in the reference hole of the rotary upper drum assembly ●, and push it in lightly. (Fig. 45)

Note : Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ● (800g·cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ● of the rotor ● in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ●. (800g·cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ● from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss●. (Fig. B in Fig. 45)

Note : See to it that the rotor earth spring ● is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ●, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ●. (500g·cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note : After mounting, be sure to make tape path adjustment in Section 4.

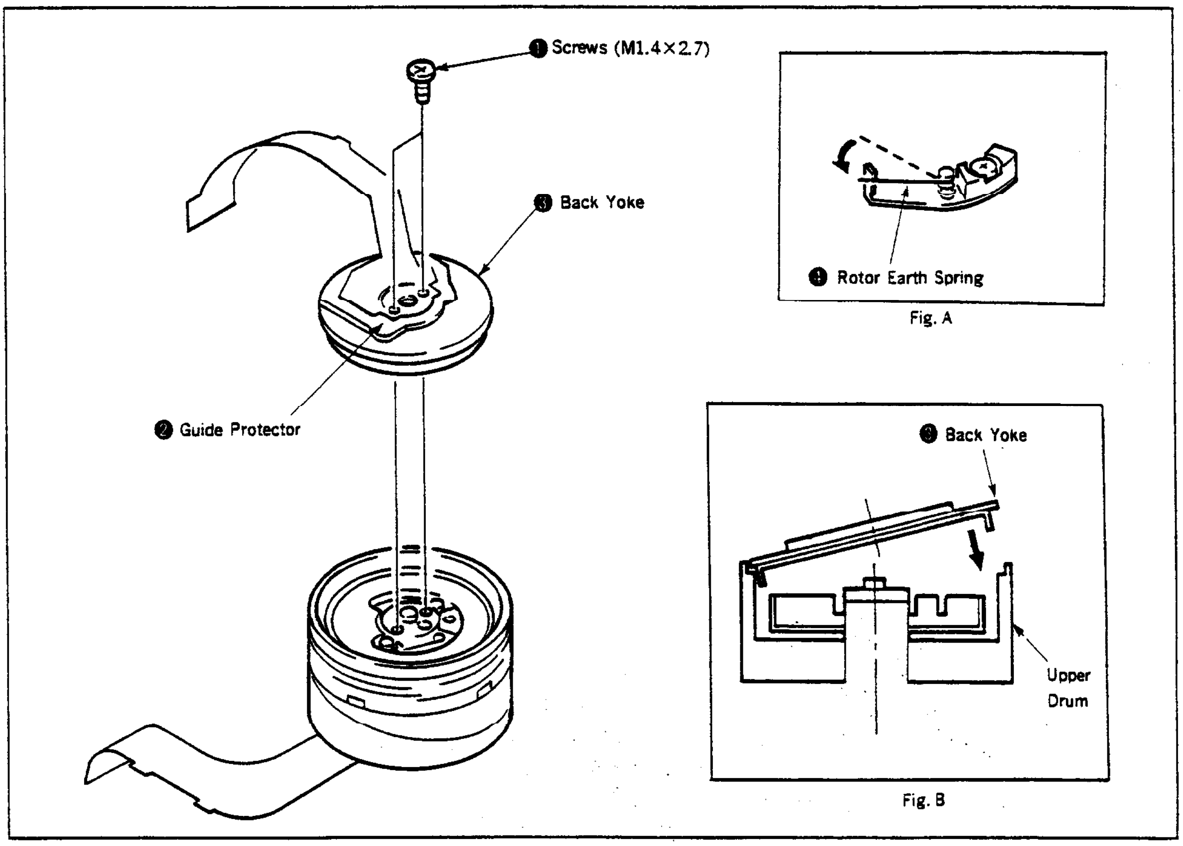

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
Fig. A
❸ Back Yoke
Upper Drum
Fig. B

Fig. 44

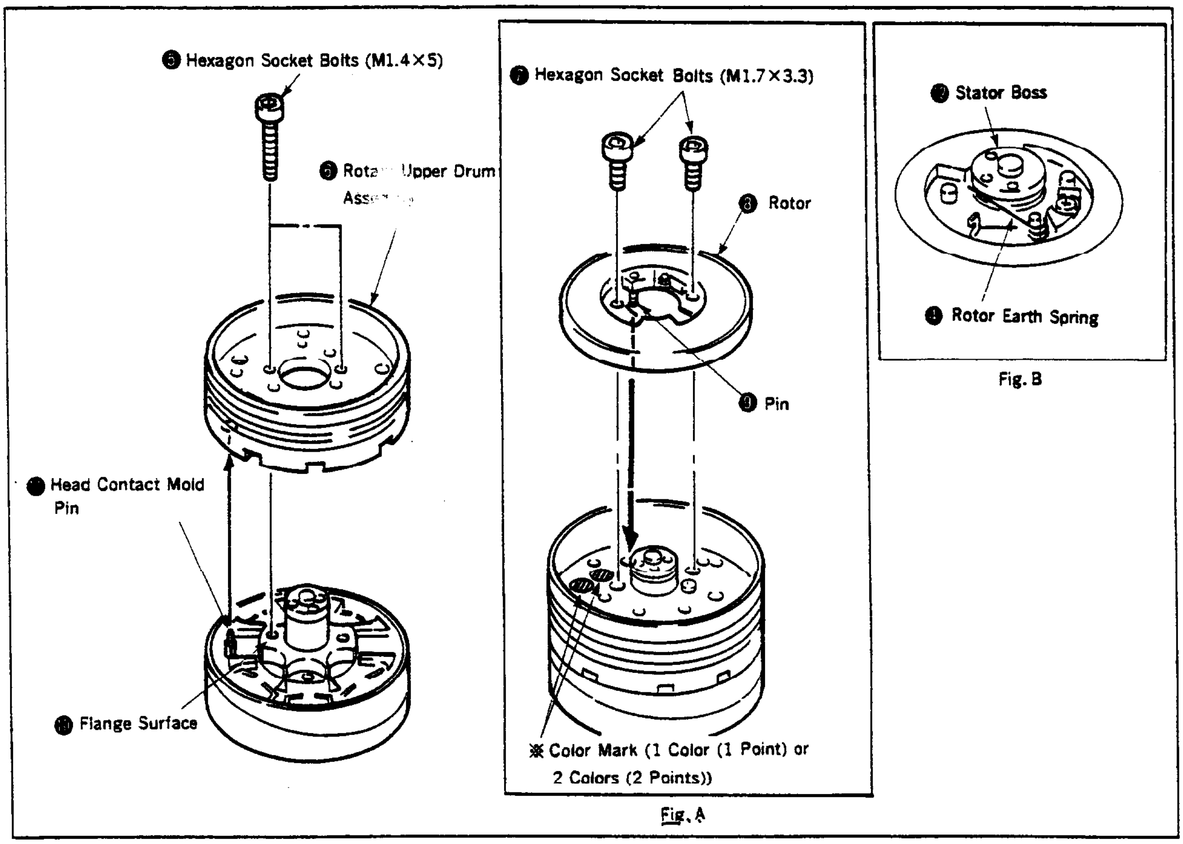

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rota Upper Drum Ass
⓫ Head Contact Mold Pin
⓬ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
Fig. A
❿ Stator Boss
❹ Rotor Earth Spring
Fig. B

Fig. 45

5 REEL TABLE HEIGHT CHECK (Fig. 46)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-1, remove the LED base.

Check

Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are ~~3.2 ± 0.5mm~~ respectively.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

changed values

A: $3.2^{+0.2}_{-0.15}$mm

B: 3.2±0.15mm

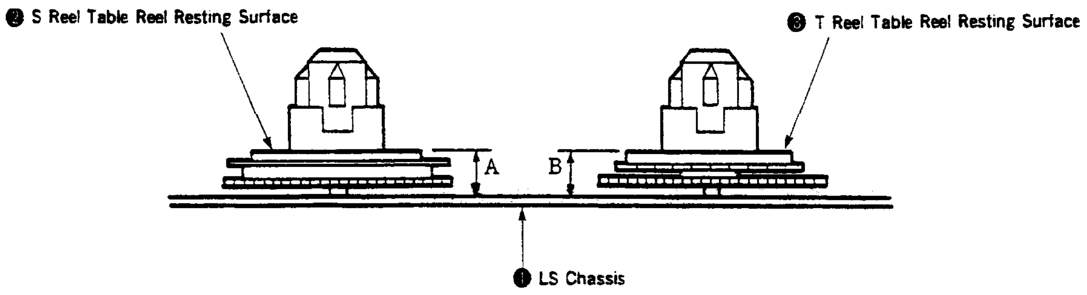

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

6 FWD/RVS TORQUE CHECK

Set the FWD/RVS take-up torque cassette (Ref. No. J-10).

In the FWD mode, check that a T reel torque value is ~~6g·cm — 16g·cm~~ ☚ **changed value** 5 – 15g·cm.

Turn on the REC/REVIEW button and check that an S reel torque value is 25g·cm – 45g·cm.

When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is ~~9.58±0.2mm.~~ (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.

changed value

9.35 – 10.7mm.

6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

Note : When taking the steps 4) and 5), remove the cassette tape first.

Note : Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

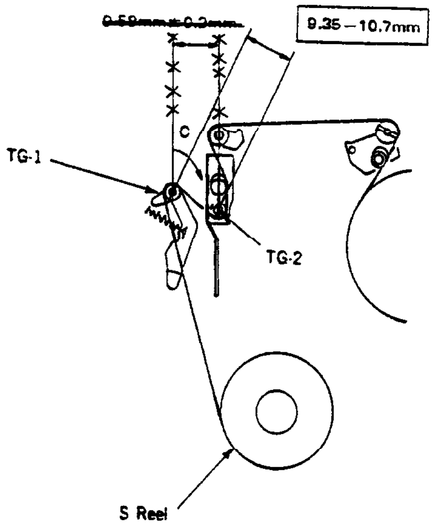


Fig. 47

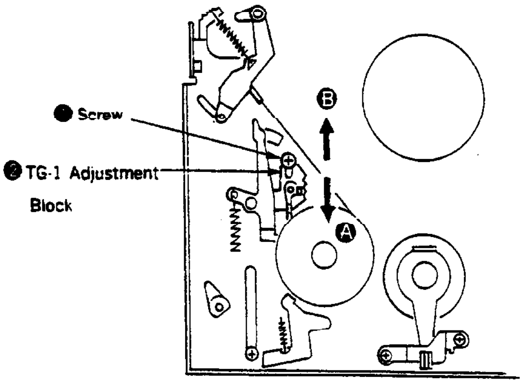


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)❶.
3) Using the dial tension gauge (Ref. No. J-7)❷, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ❸ position as shown in Fig. A so that measure center value of the tention is 4 g-6.5g.

Note : When this is done, see to it that the gear ❹ is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

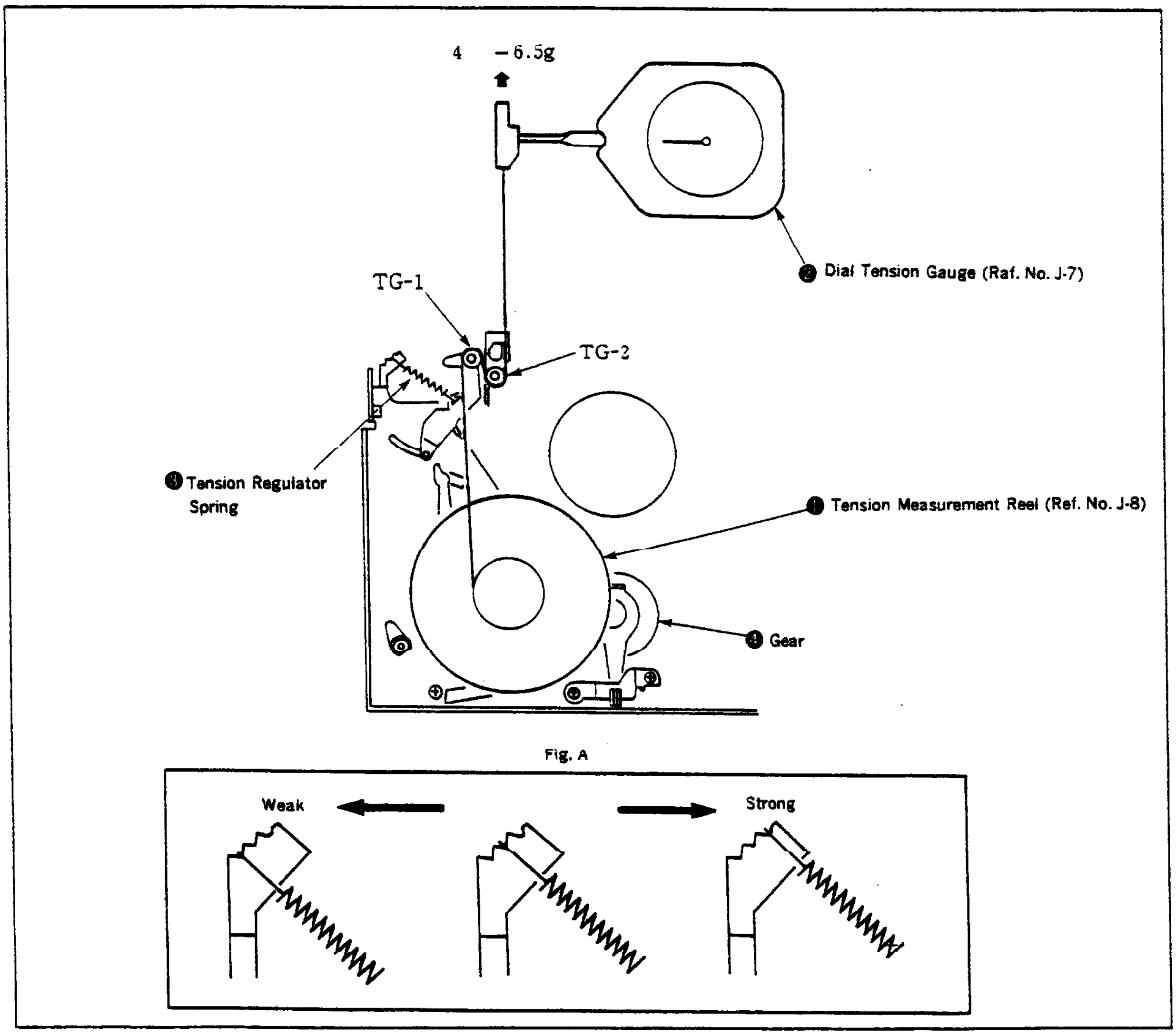

4 -6.5g
❷ Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
❸ Tension Regulator Spring
❶ Tension Measurement Reel (Ref. No. J-8)
❹ Gear
Fig. A
Weak
Strong

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N), (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)

   When it is not flat, make adjustment in accordance with the procedures below.

   When the RF waveform is not flat at the inlet/outlet; (Fig.50 ⓑ and ⓒ)

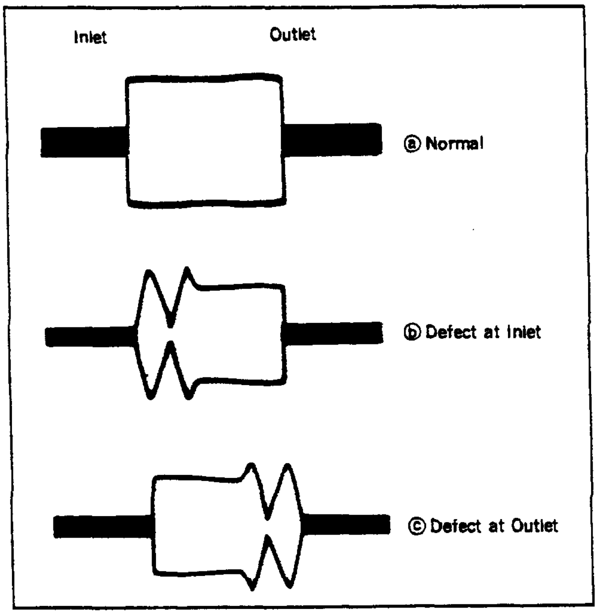

Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50

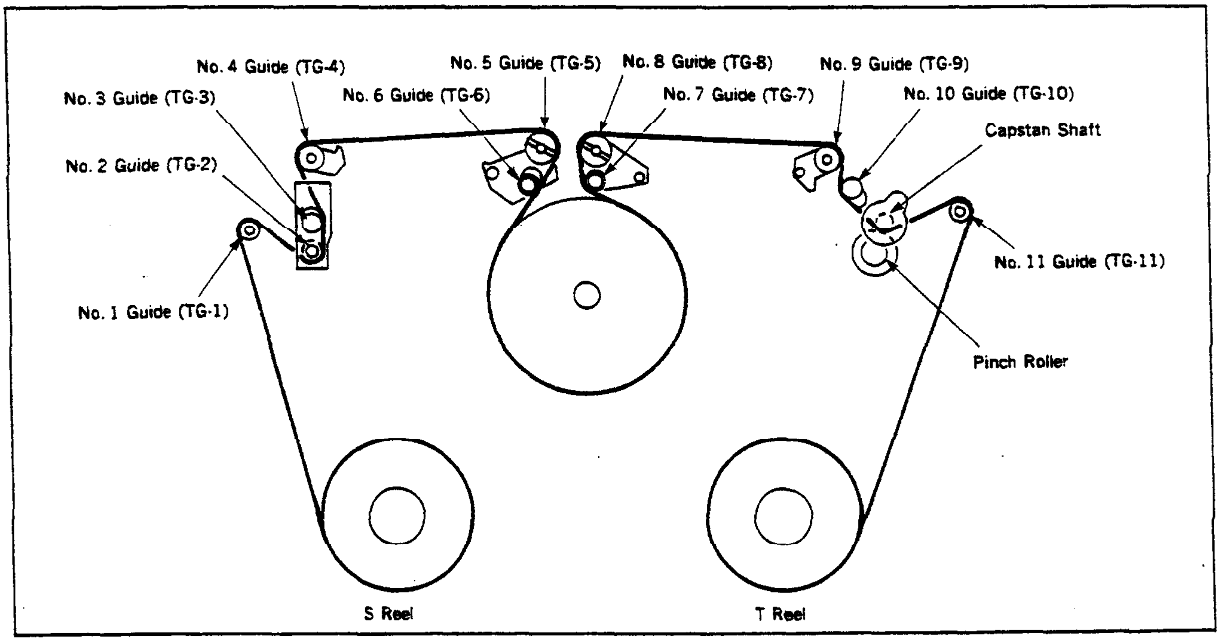

No. 4 Guide (TG-4)
No. 5 Guide (TG-5)
No. 8 Guide (TG-8)
No. 9 Guide (TG-9)
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
No. 7 Guide (TG-7)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ● and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ● to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ● and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ● to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

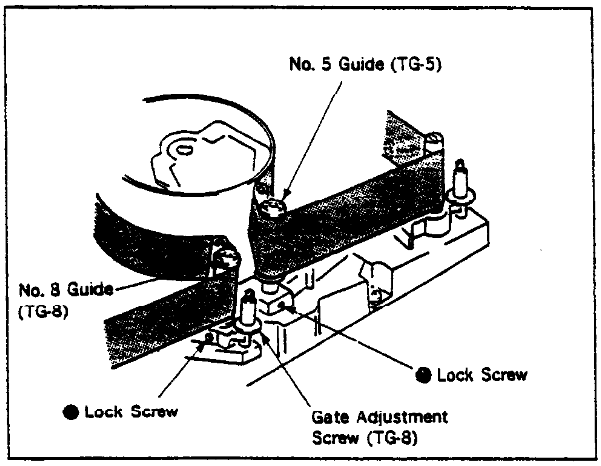


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

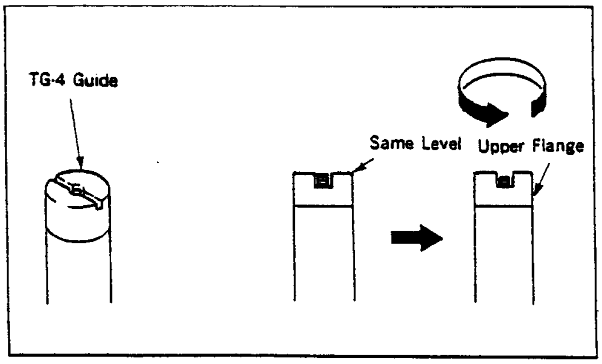


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counter-clockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.
When this is done, check that a tracking waveform (Fig. 54) is not changed.
When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

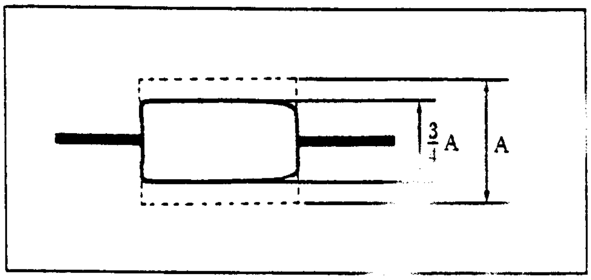


Fig. 54

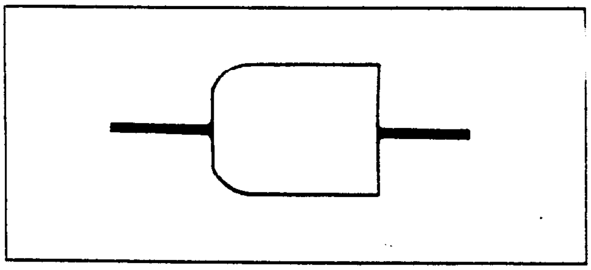


Fig. 55

Tape Path Adjustment for "Guide Rai [illegible] 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lo[illegible]ge is curled in the REV mode, turn the TG-4 gate ac[illegible]g screw at pitches of 45° to the left to remove a curl. ([illegible]ck screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw. After adjustment, tighten the lock screw.)

If the TG-4 gate adjusting screw is turned to the left too much, the TG-2 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

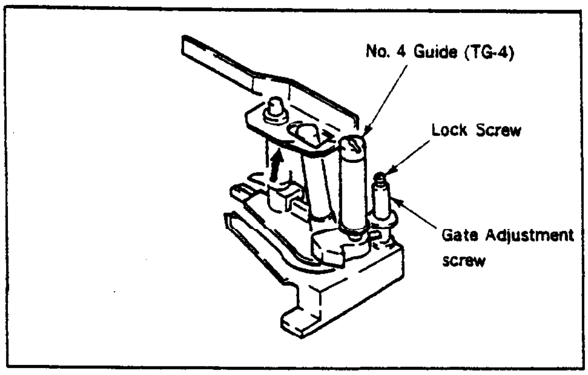


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
   (Criterion: 0.5mm or less)
   when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

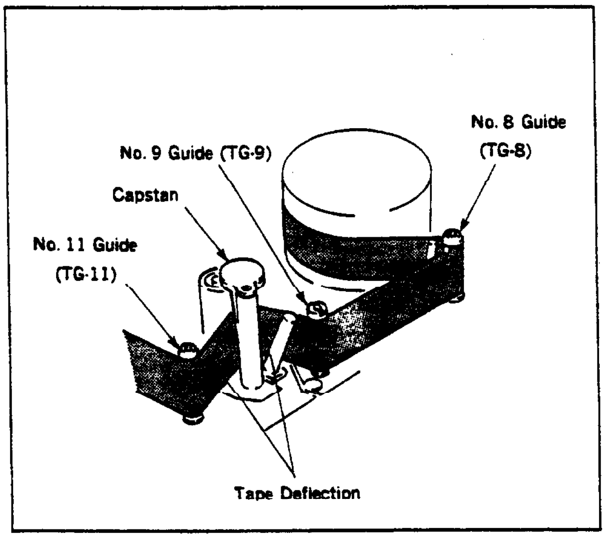

No. 8 Guide
(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

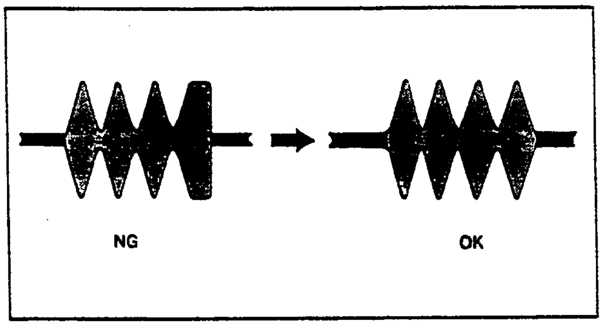


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

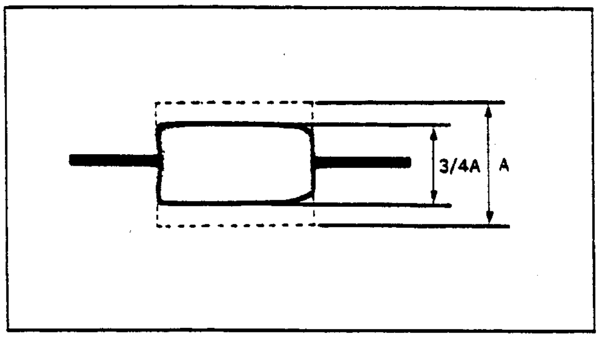


Fig. 59

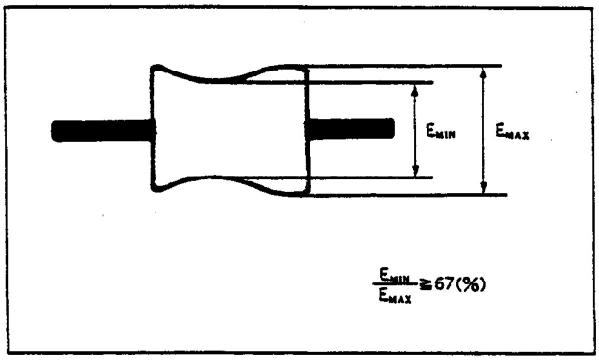


Fig. 60

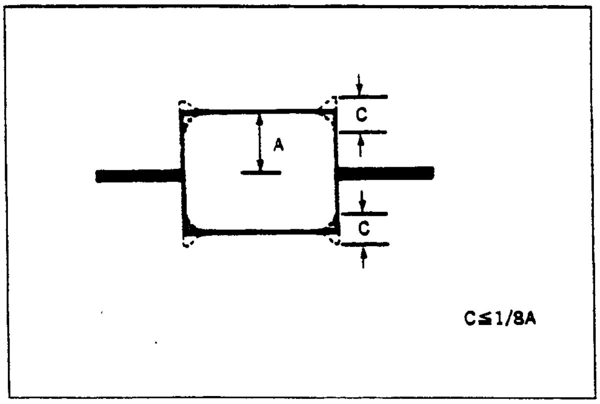


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the REV mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the CUE mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

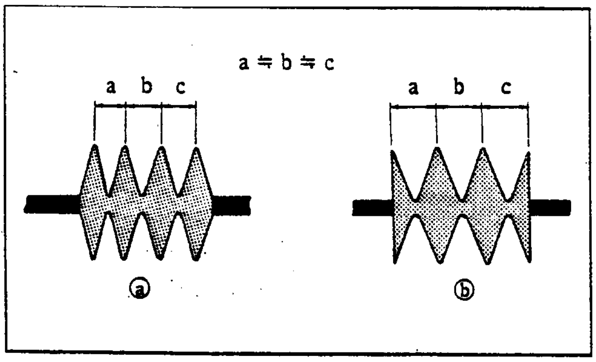


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

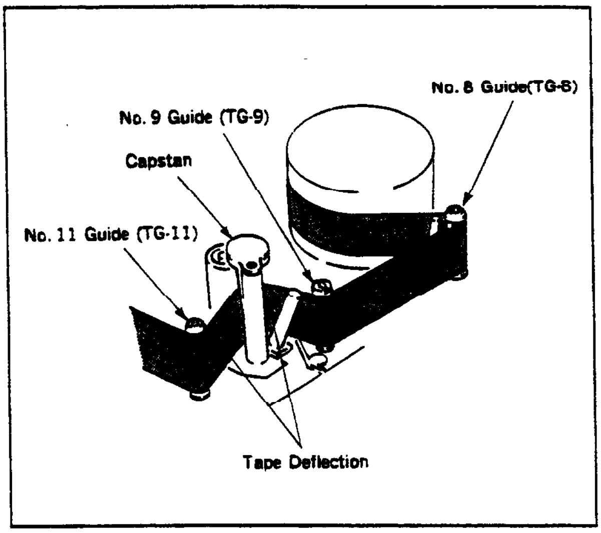

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

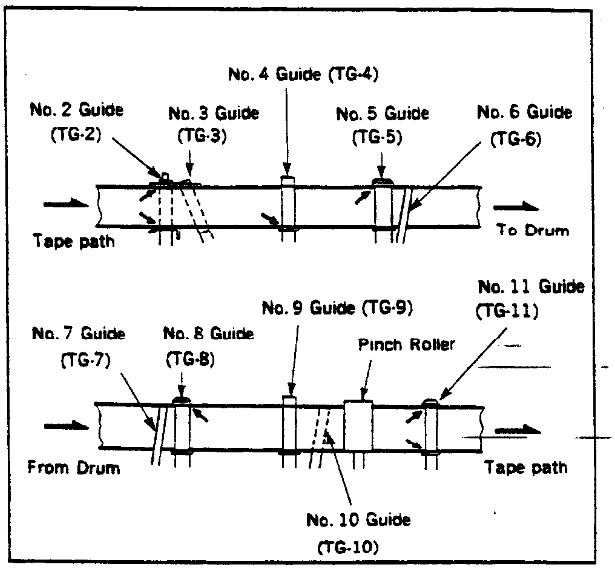
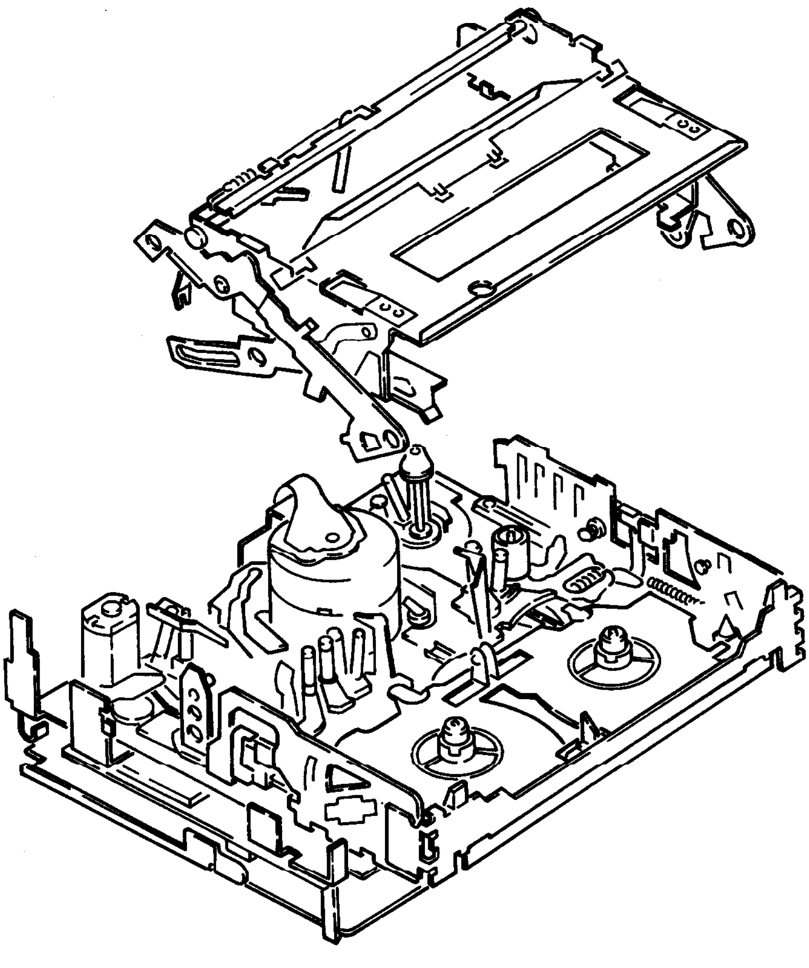

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ●, and then, the LS support ●.
3) Remove the four screws ●, and then, the LS frame assy ●.
4) Remove the three lock washers ●, and then, the washer ●, bar, joint ●, T protector assy ●, and TP arm assy ● in that order.
5) Remove the two screws●, and then, the two arm shafts A●.
6) Remove the shaft through the long hole●. With the cassette compartment holder assembly●rotated in a direction of the arrowⒶ, remove the long holes●and●from the shaft in that order, and then, remove the cassette compartment holder assembly●.
7) Slide the BS holder●in a direction of the arrow Ⓑ as shown in Fig. A and remove it in a direction of the arrowⒸ.

Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ●.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder●in the reverse order of its removal. Note: Refer to Fig. A.
3) Mount the shafts in the order of the long holes ●, ●and● of the cassette compartment holder assembly●, respectively.

Note : When this is done, rotate the cassette compartment holder assembly●in a direction of the arrowⒶ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A●with the long holes of the LS chassis, fit them in firmly and fix with the two screws●.
5) Mount the TP arm assy ●, T protector assy ● and bar, joint ●, respectively. Then, mount the washer ● and three lock washers ●.
6) Mount the LS frame assy ● to the chassis and fix with the four screws ●.
7) Mount the LS support ● to the chassis and fix with the screw ●.

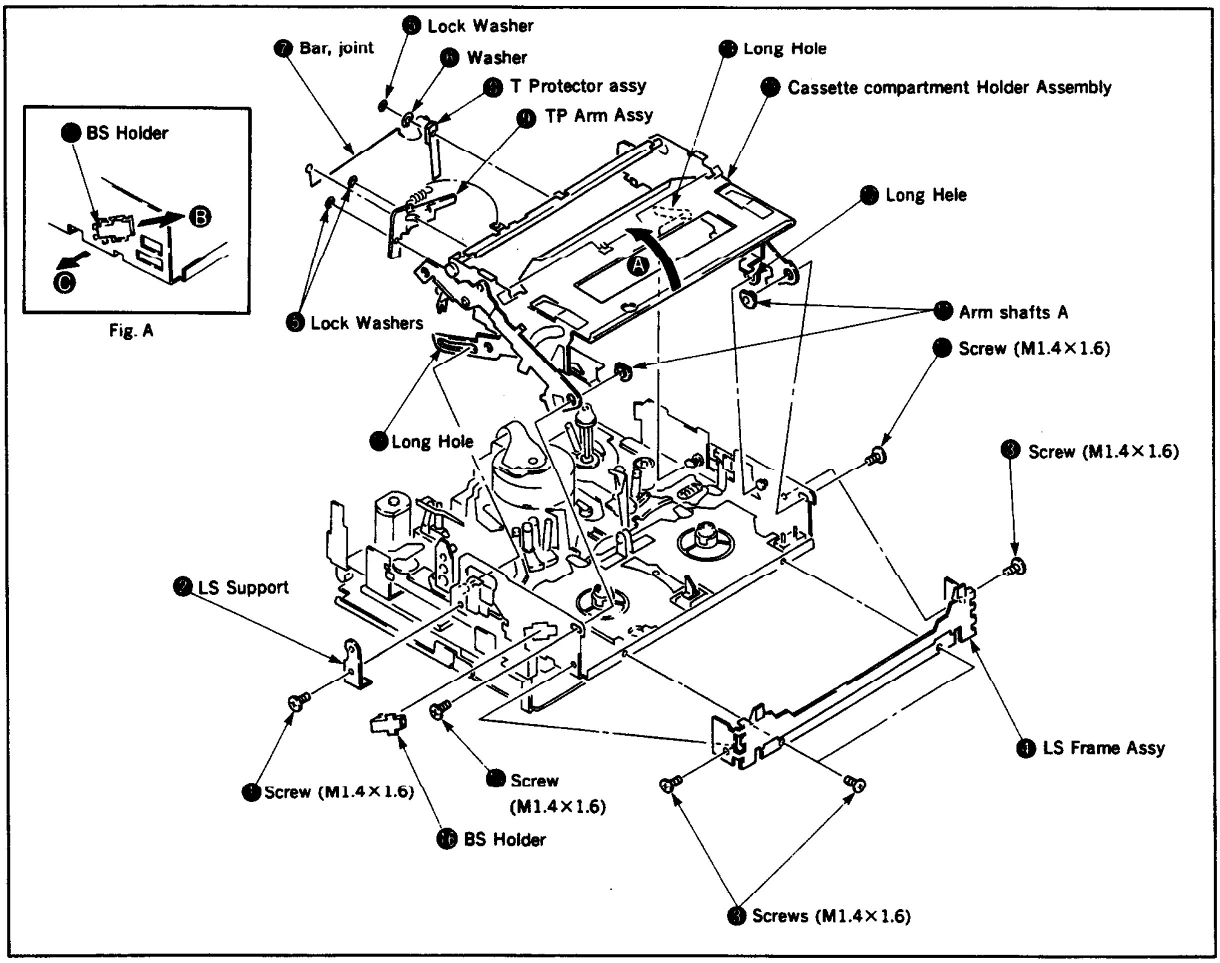

● BS Holder
Ⓑ
Ⓒ
Fig. A
● Lock Washer
⑦ Bar, joint
● Washer
● T Protector assy
● TP Arm Assy
● Long Hole
● Cassette compartment Holder Assembly
● Long Hele
Ⓐ
● Arm shafts A
● Screw (M1.4×1.6)
● Lock Washers
● Long Hole
● Screw (M1.4×1.6)
● LS Support
● LS Frame Assy
● Screw (M1.4×1.6)
● Screw
(M1.4×1.6)
● BS Holder
● Screws (M1.4×1.6)

Fig. 1

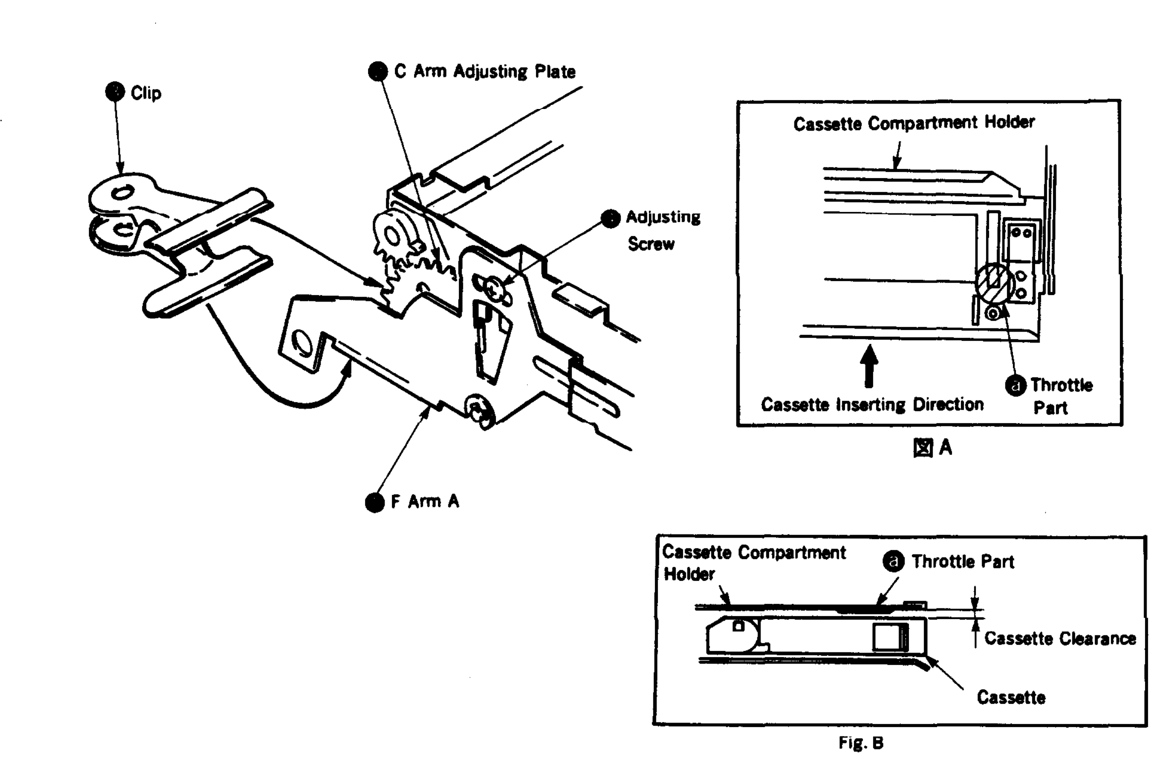
1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle part ⓐ.

2) Pressing the part ⓐ, nip the F arm A ● and the first tooth of the C arm adjusting plate ● with the clip ●, and tighten the adjusting screw ● at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ● after making sure of the following clearances between the throttle part ⓐ of the cassette compartment holder and the cassette as shown in Fig. B.
   - For 15mm-thick dummy cassette : 0.5 – 0.9
   - For 15.2mm-thick dummy cassette : 0.3 – 0.7


● Clip
● C Arm Adjusting Plate
● Adjusting Screw
● F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ● on the LED assembly ●.
3) Press the pin of the push switch ● (ON state) and fix it with adhesive tape ● in that state.
4) Press the locking plate release arm ● in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ● and ● for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ● and ●.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

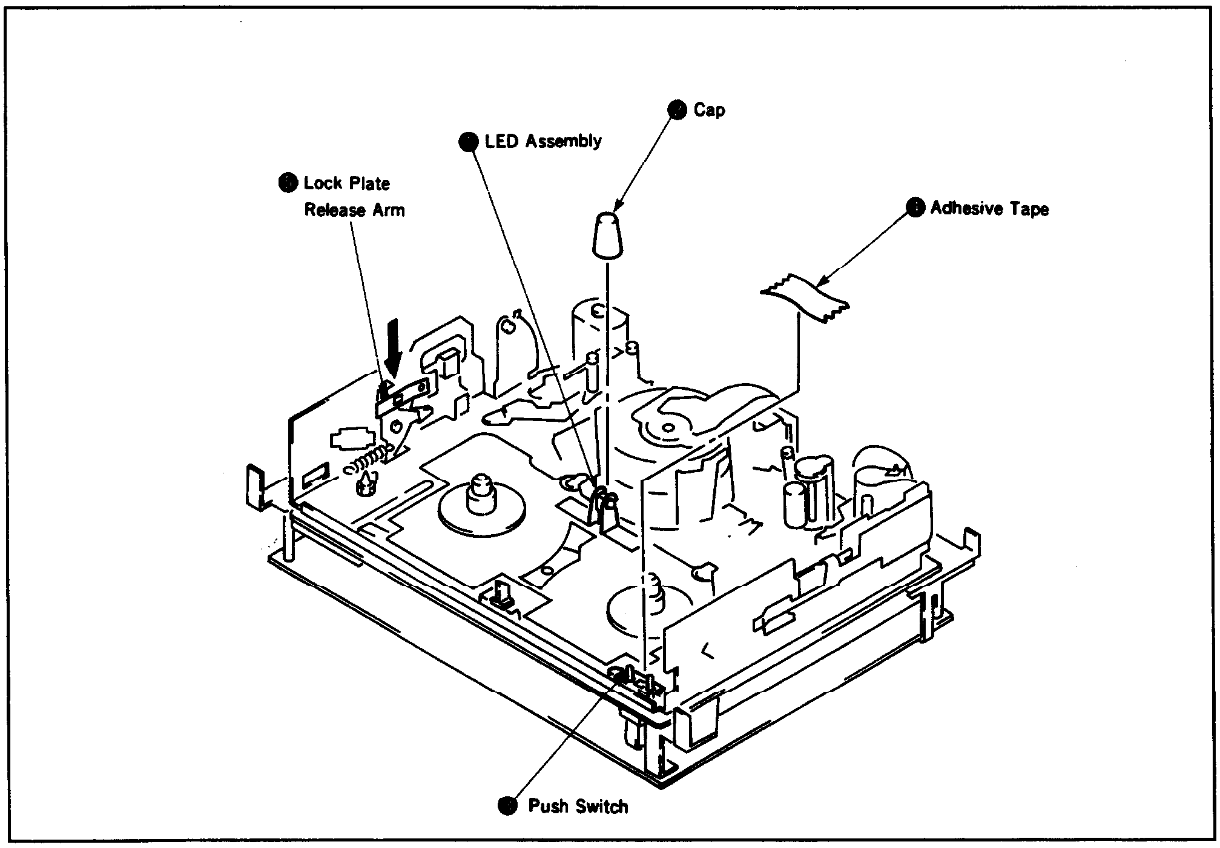


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

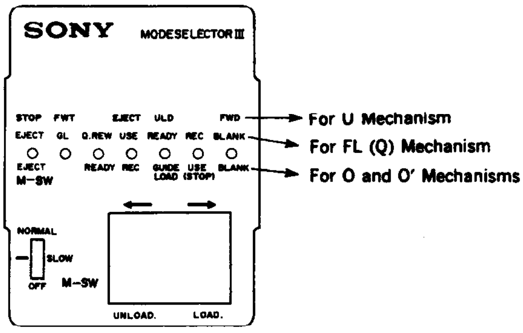
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ●.
2) Remove the screw ●, and then, the LB-12 board ●.
3) Remove the FP-114 flexible connector ● and loading motor connector ●, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD.
LOAD.
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

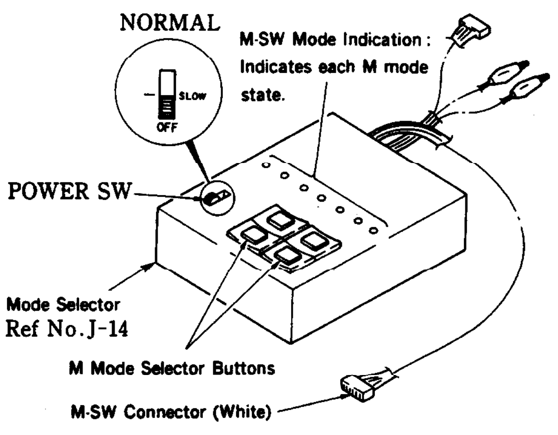

NORMAL
SLOW
OFF
M-SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref No.J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

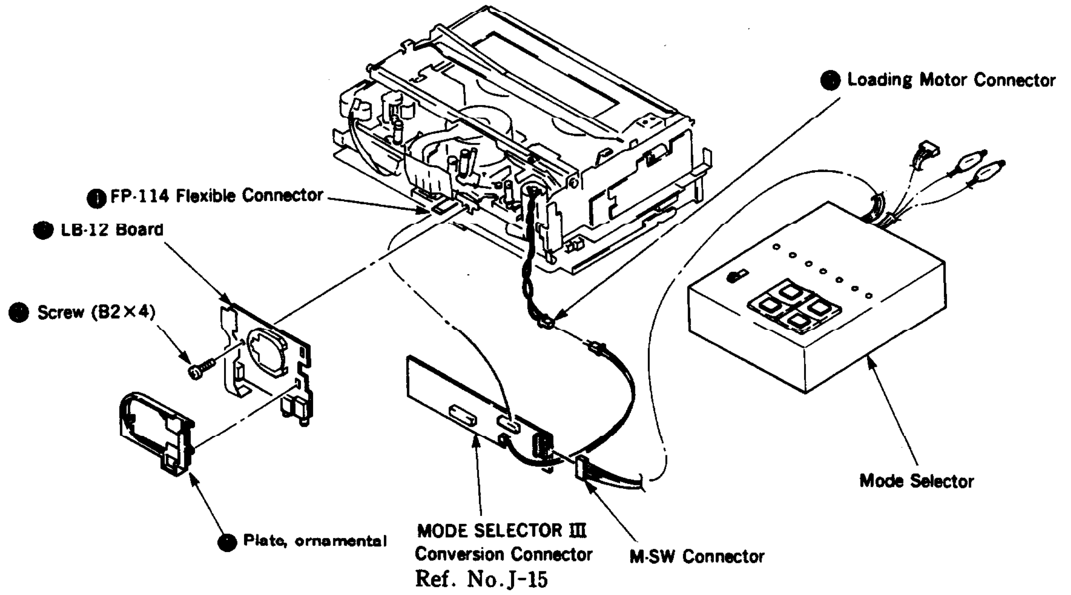
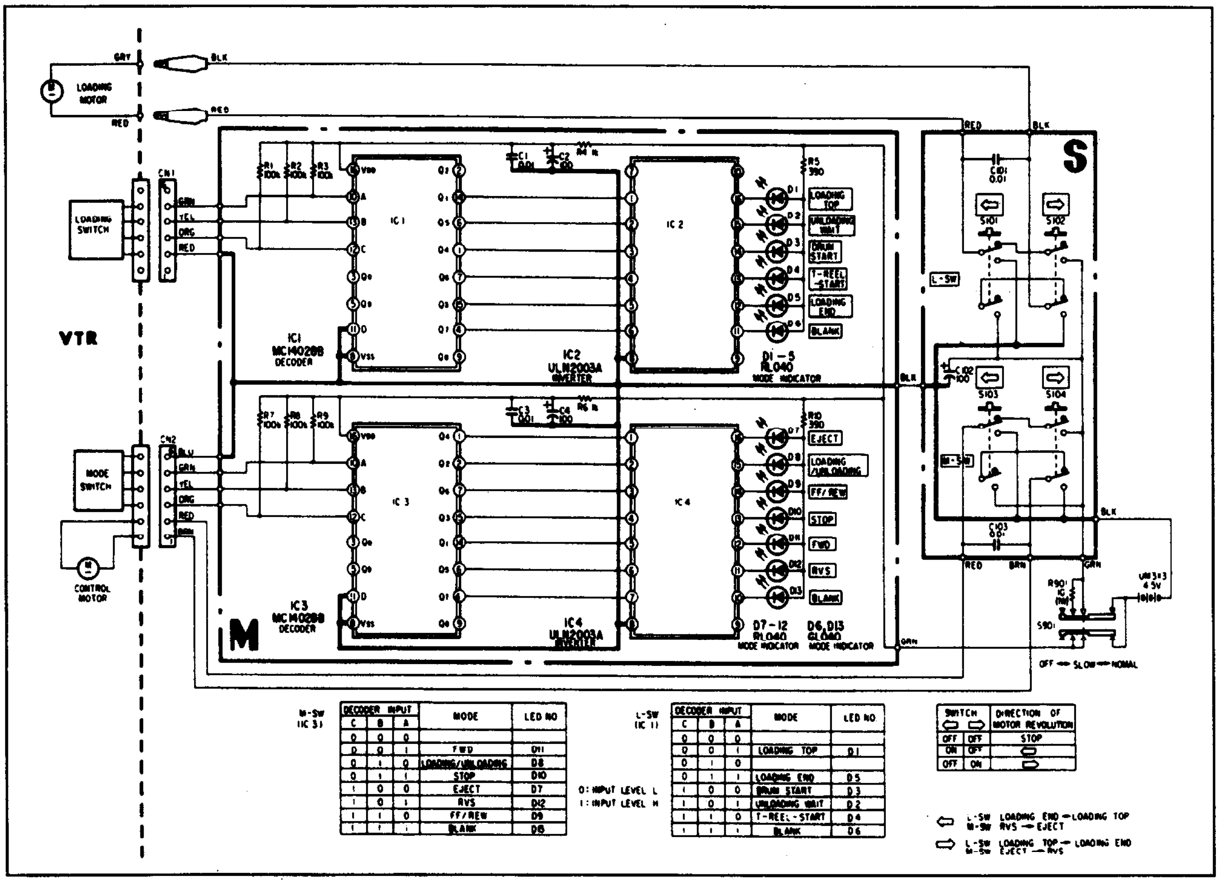

● Loading Motor Connector
● FP-114 Flexible Connector
● LB-12 Board
● Screw (B2×4)
● Plate, ornamental
MODE SELECTOR III
Conversion Connector
Ref. No.J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
MODE SWITCH
BLU
GRN
YEL
ORG
RED
BRN
CONTROL MOTOR
R1 100k
R2 100k
R3 100k
R7 100k
R8 100k
R9 100k
C1 0.01
C2 100
C3 0.01
C4 100
R4 1k
R6 1k
R5 390
R10 390
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
VDD
VSS
A
B
C
D
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL-START
LOADING END
BLANK
D1-5
RL040
MODE INDICATOR
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7-12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
M
S
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
RED
BLK
BRN
GRN
R901 1Ω (1W)
UM3×3 4.5V
S901
OFF ⟷ SLOW ⟷ NOMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D6

0 : INPUT LEVEL L
1 : INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO.
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description
		CAPACITOR
C1	1-108-579-00	MILER 0.01μF 50V
C2	1-123-333-00	ELECT 100μF 24V
C3	1-108-579-00	MILER 0.01μF 50V
C4	1-123-333-00	ELECT 100μF 24V
C101	1-108-579-00	MILER 0.01μF 50V
C102	1-123-333-00	ELECT 100μF 24V
C103	1-108-579-00	MILER 0.01μF 50V
		DIODE
D1	8-719-812-31	DIODE TLR123
D2	8-719-812-31	DIODE TLR123
D3	8-719-812-31	DIODE TLR123
D4	8-719-812-31	DIODE TLR123
D5	8-719-812-31	DIODE TLR123
D6	8-719-812-33	DIODE TLG123A
D7	8-719-812-31	DIODE TLR123
D8	8-719-812-31	DIODE TLR123
D9	8-719-812-31	DIODE TLR123
D10	8-719-812-31	DIODE TLR123
D11	8-719-812-31	DIODE TLR123
D12	8-719-812-31	DIODE TLR123
D13	8-719-812-33	DIODE TLG123A

Ref. No	Part No.	Description
		IC
IC1	8-752-240-28	IC TC4028BP
IC2	8-752-120-03	IC μPA2003C
IC3	8-759-240-28	IC TC4028BP
IC4	8-759-120-03	IC μPA2003C
		RESISTOR
R1	1-247-179-00	CARBON 100K 1/4W
R2	1-247-179-00	CARBON 100K 1/4W
R3	1-247-179-00	CARBON 100K 1/4W
R4	1-247-131-00	CARBON 1K 1/4W
R5	1-247-121-00	CARBON 390 1/4W
R6	1-247-131-00	CARBON 1K 1/4W
R7	1-247-179-00	CARBON 100K 1/4W
R8	1-247-179-00	CARBON 100K 1/4W
R9	1-247-179-00	CARBON 100K 1/4W
R10	1-247-121-00	CARBON 390 1/4W
R901	1-214-594-00	METAL 10 1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

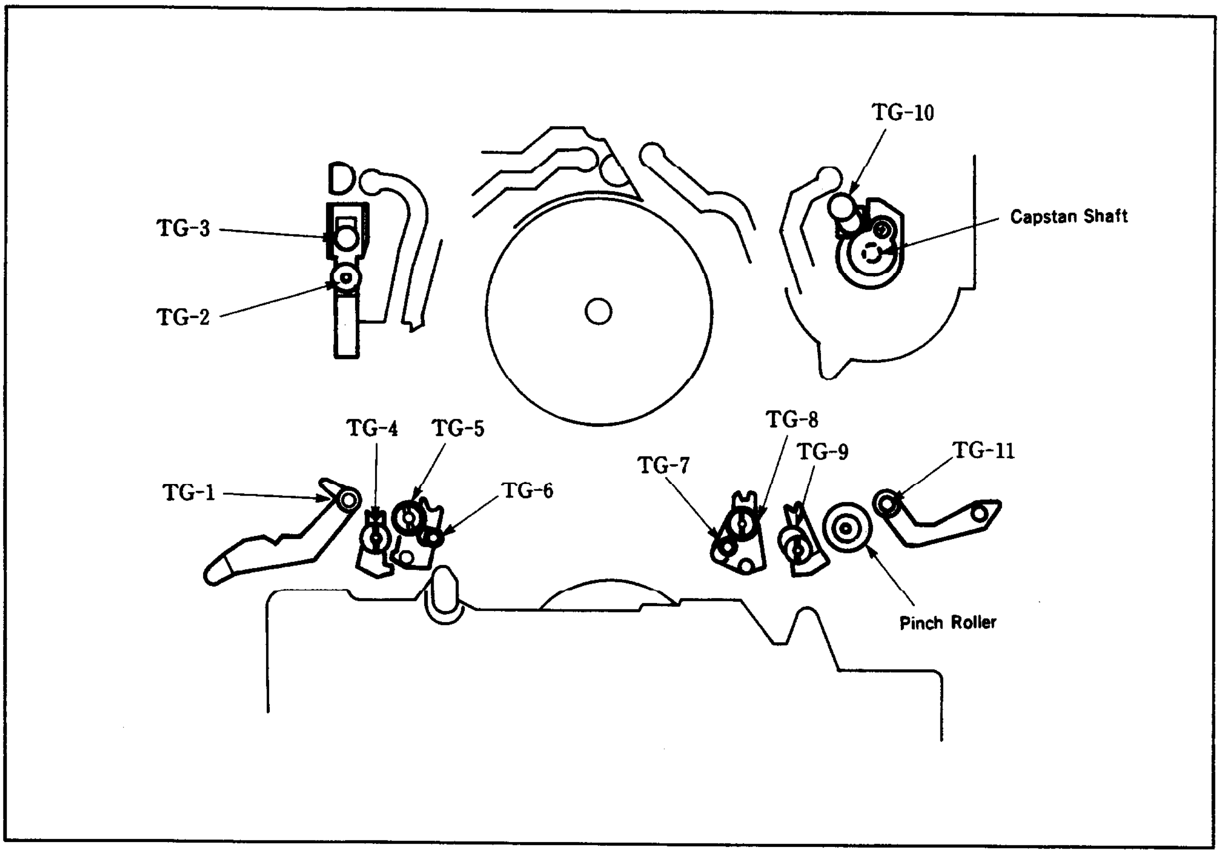


Fig. 7

2-3 PERIODIC CHECK ITEMS

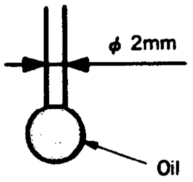
Location of Maintenance and check		**Hours of Use (H)**										**Remarks**
		500	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**	**4000**	**4500**	**5000**	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-212-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning   ◎ : Oil   ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

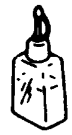


2-4 Service jigs list

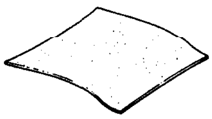
Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector III panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector III conversion connector	J-6082-021-A		

Other equipment
- Oscilloscope
- Analog tester (20kΩ)

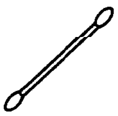
J-1



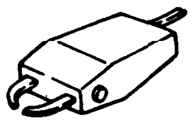
J-2



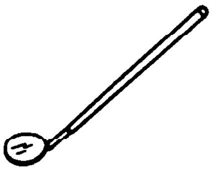
J-3



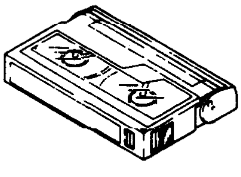
J-4



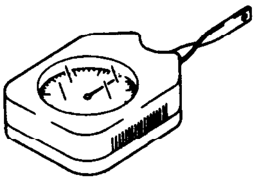
J-5



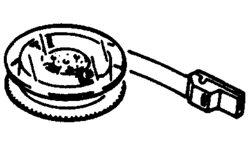
J-6



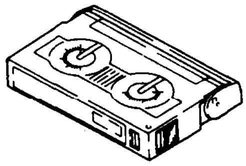
J-7



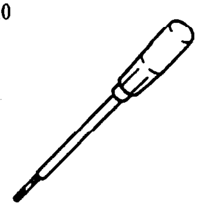
J-8



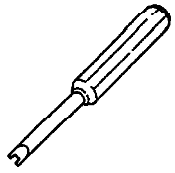
J-9



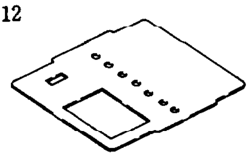
J-10



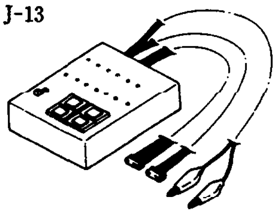
J-11



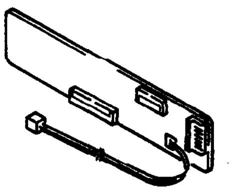
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A, rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrow Ⓑ.
4) Remove the three screws ●, ● and ●.
5) Lifting the LED base ●, remove it by pushing it in a direction of the arrow Ⓒ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ● of the LED base ● in the notch ● of the LS chassis without catching the LED in between. Next, fit to the dowels ● at 2 places.
3) Mount and tighten the screws ●, ● and ● in that order.
4) As shown in Fig. B, set the LED in a direction of the arrow Ⓐ and rotate it in a direction of the arrow Ⓑ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ● of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

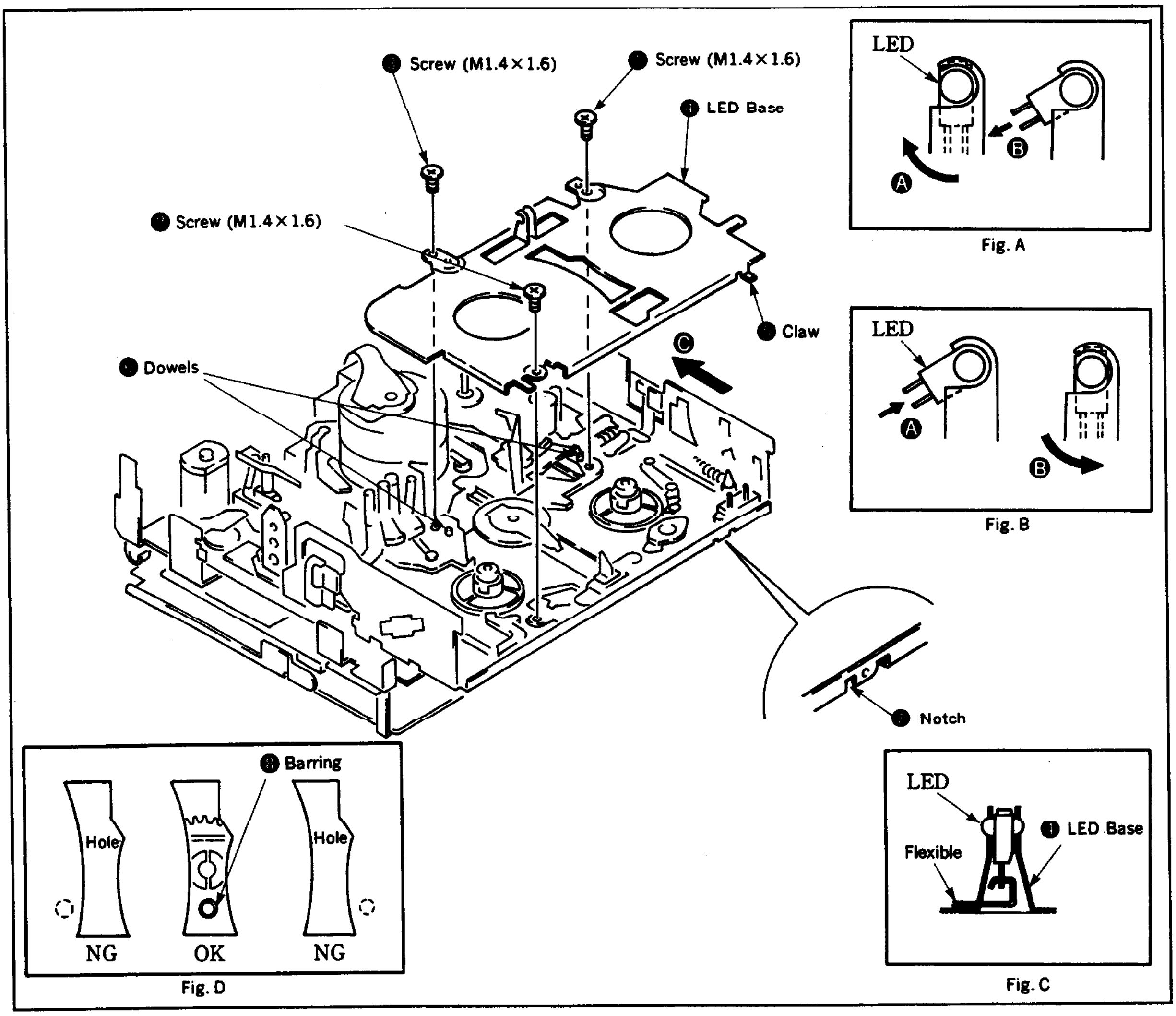

● Screw (M1.4×1.6)
● Screw (M1.4×1.6)
● LED Base
● Screw (M1.4×1.6)
● Claw
Ⓒ
● Dowels
● Notch
LED
Ⓐ
Ⓑ
Fig. A
LED
Ⓐ
Ⓑ
Fig. B
● Barring
Hole
Hole
NG
OK
NG
Fig. D
LED
Flexible
● LED Base
Fig. C

Fig. 8

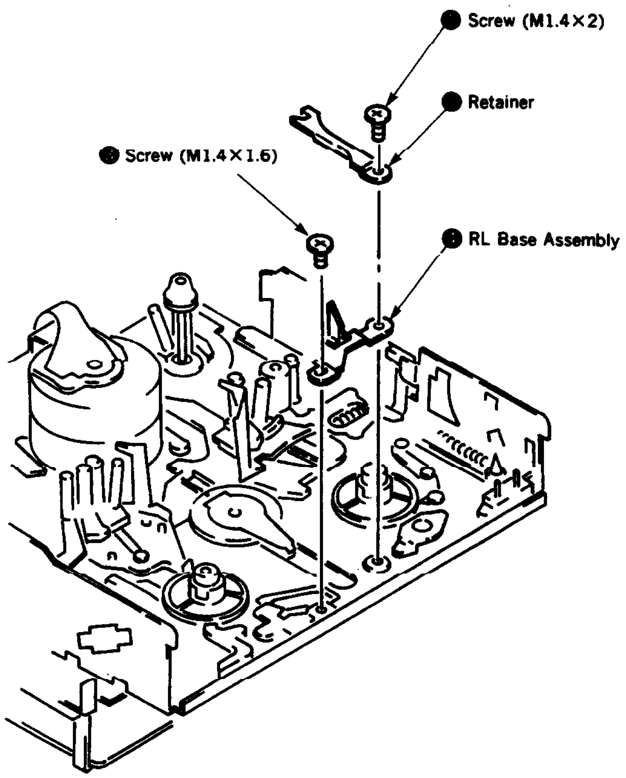
3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, retainer ●.
5) Remove the screw ●, and then, RL base assembly ●.

2. Mounting

1) Select the USE mode.
2) With the screw ●, mount the RL base assembly ● to the LS chassis.
3) With the screw ● fix the retainer ● to the RL base assembly ●.
   When this is done, align the bump part ⁎ of the retainer ● with the bump part ⁎ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.


● Screw (M1.4×2)
● Retainer
● Screw (M1.4×1.6)
● RL Base Assembly

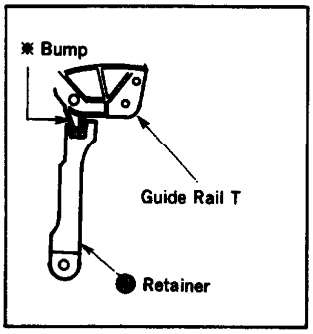

⁎ Bump
Guide Rail T
● Retainer

Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the $\boxed{\text{USE}}$ mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ● in the $\boxed{\text{USE}}$ mode, remove the string out of the groove of the table assy, reel, supply ●. When this is done, be careful not to bend the tension regulator string ● and the S soft arm ● must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ●.

Note : Dismount and remount the table assy, reel, supply ●, holding the reel claw ✱.

2. Mounting

1) Select the $\boxed{\text{USE}}$ mode.
2) As shown in Fig. B, move the S soft arm ● in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ●, mount the table assy, reel, supply ● to the shaft ●.
4) Put the tension regulator string ● in the groove of the table assy, reel, supply ● and fit it properly by turning the table assy, reel, supply ●.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ● with naked hand. Also, be careful of adhesion of grease, etc.

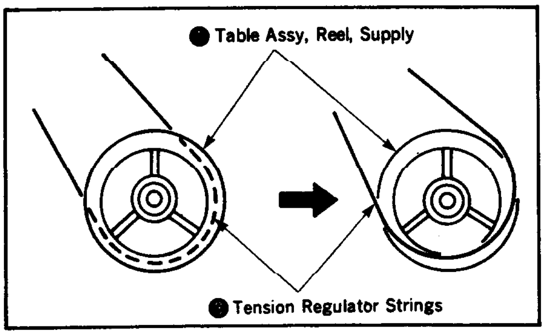

● Table Assy, Reel, Supply
● Tension Regulator Strings

Fig. A

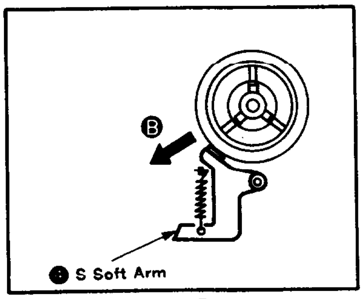


Fig. B

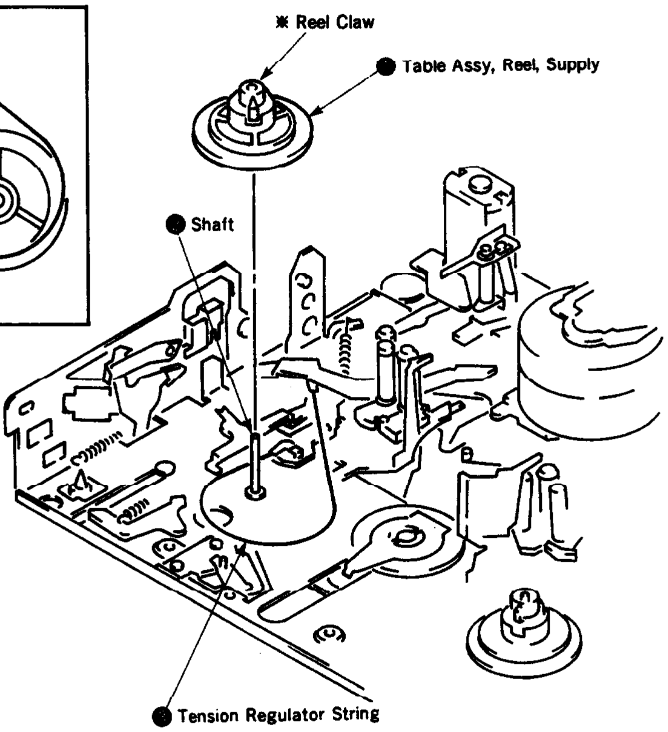

✱ Reel Claw
● Table Assy, Reel, Supply
● Shaft
● Tension Regulator String

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ● in a direction of the arrowⒶ.
6) With the claw (T ratchet head) of the T ratchet ● moved in a direction of the arrowⒷ, remove the Table assy, reel, take-up ●.

Note : Dismount and remount the Table assy, reel, take-up ●, holding the reel claw ✱.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ● moved in an arrow direction, mount the Table assy, reel, take-up ● to the shaft ●.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

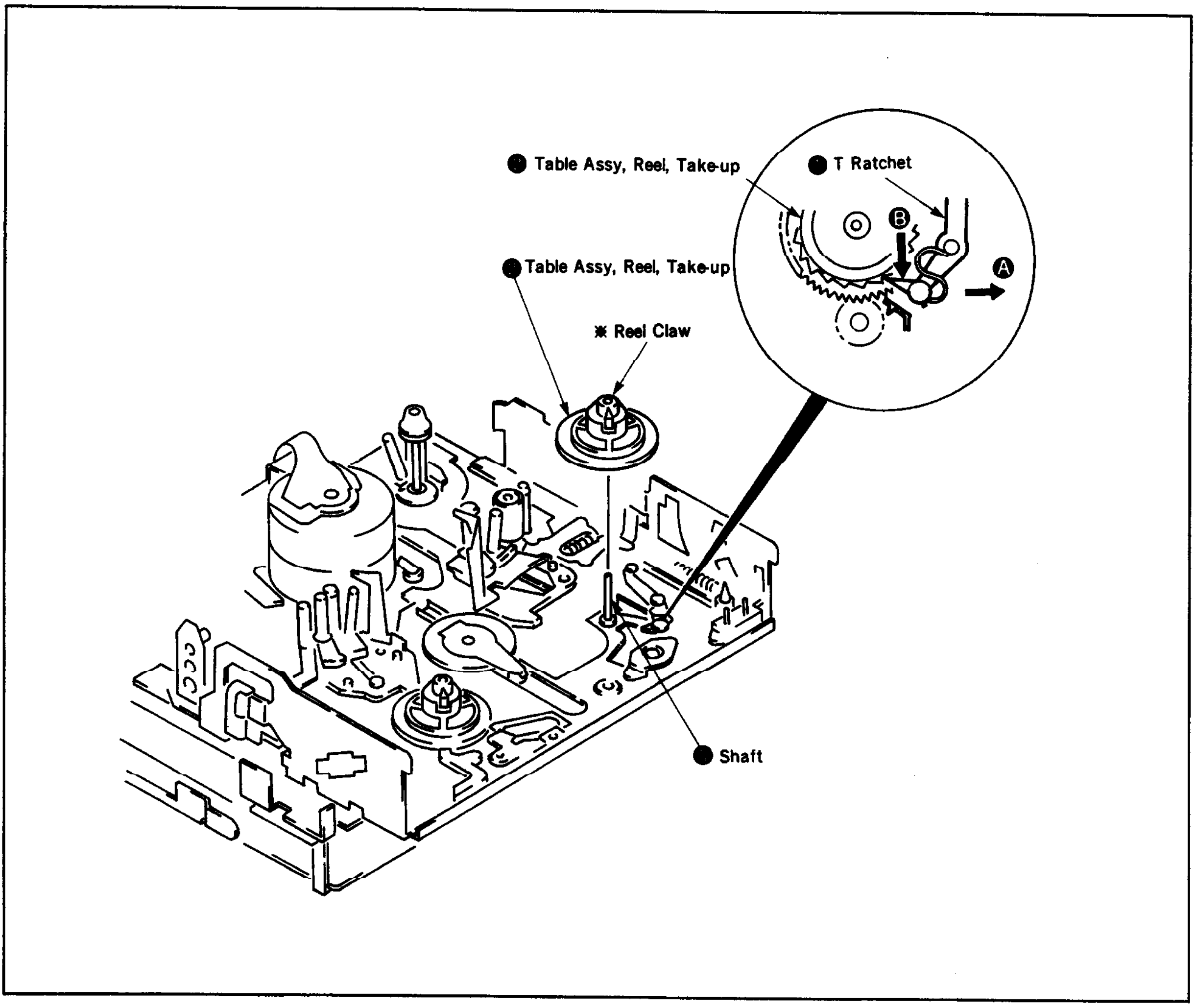


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, oneway clutch assembly ●.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ● to the LS chassis and fix with the screw ●.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

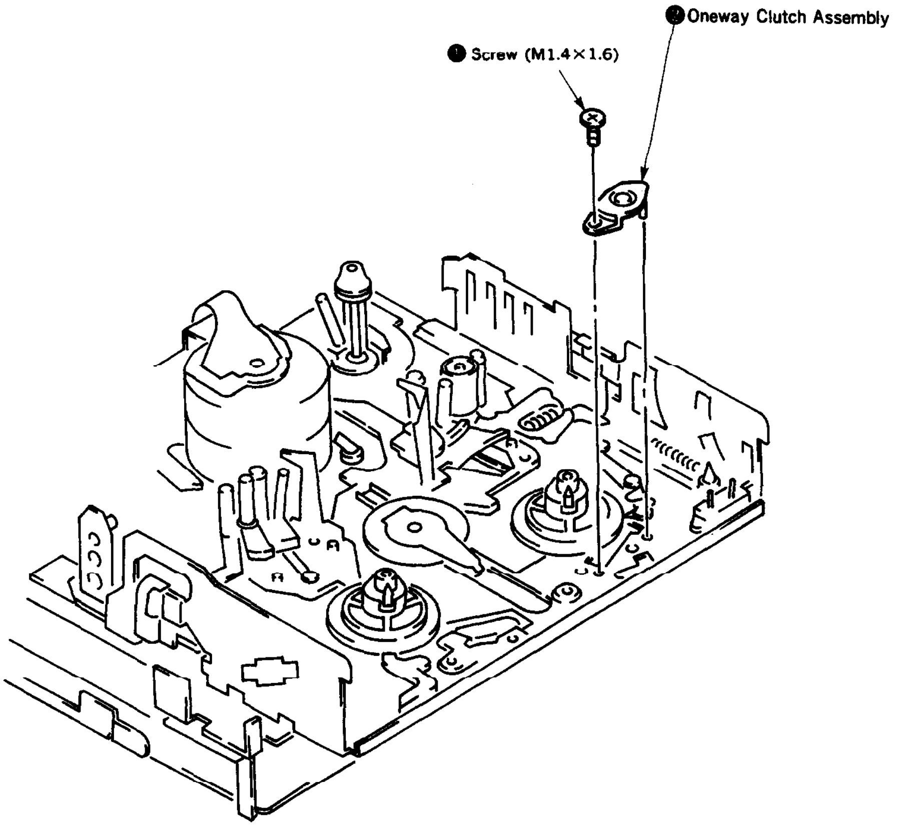


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ●, and then, the spring, tension ●.
5) Remove the S soft arm assembly ● by rotating it in an arrow direction (until the hook ● comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowir dicated part of the shaft ●.
3) Mount the S soft arm assembly ● to the shaft ●, rotating it i as arrow direction. (Be careful not to bend the hook ●.)
4) Hook the spring, tension 2 onto the claw and fix it with locl washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holde assembly.

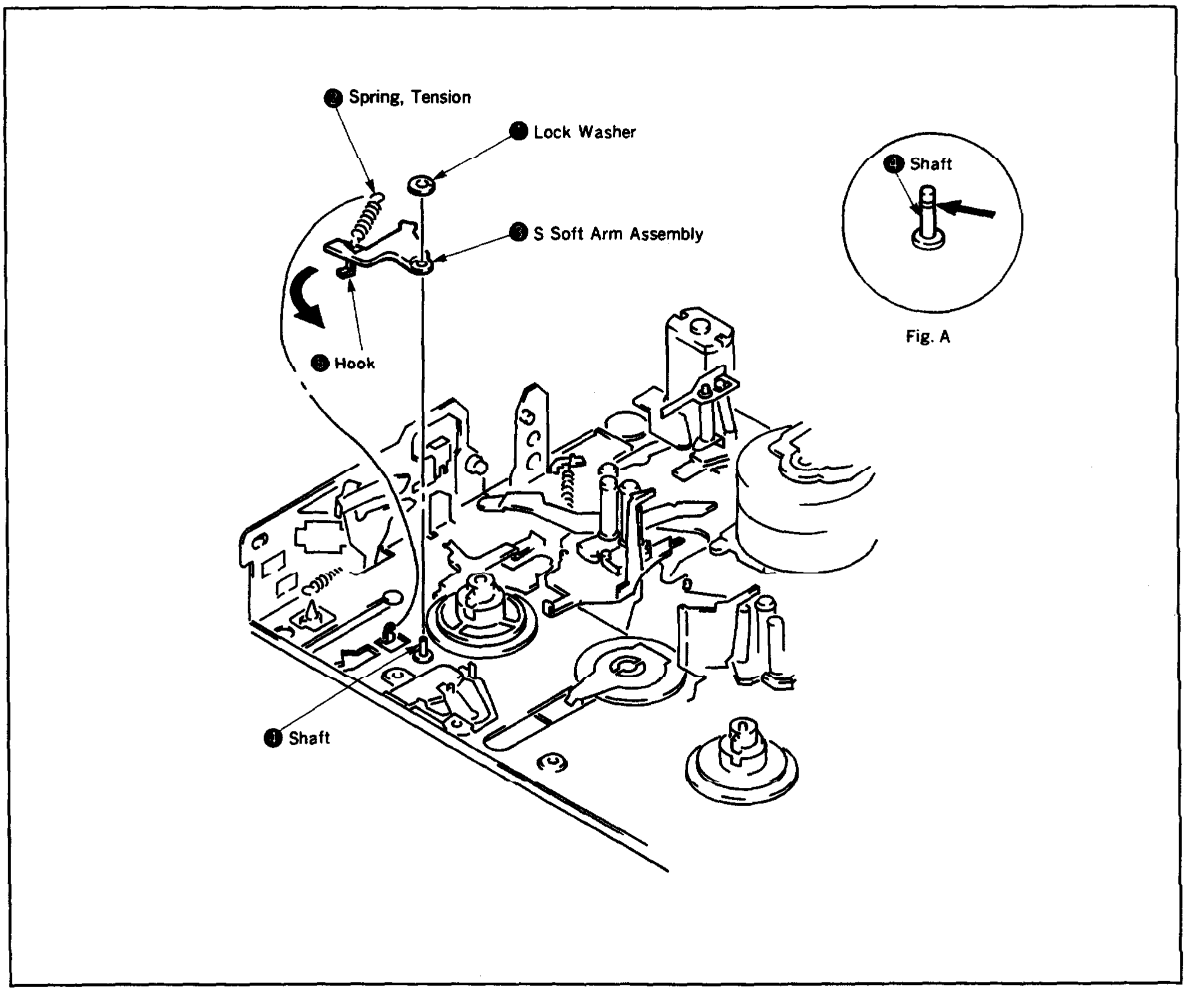


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ❶, and then, arm assy gear ❷.
6) Select the Q, REW mode.
7) Remove the flexible rotary shaft ❸, and then, the flexible connector ❹.
8) Remove the E retaining ring ❺ and three screws ❻.
9) Remove the LS chassis assembly ❼ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ❼.
2) Unload in the RDY mode. Start docking in the Q, REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ❼, it is necessary to place the following parts at specified positions.
3) Put the pin ㉔of the pinch arm assembly ㉓into the left side of the pinch press arm assembly㉕. (Fig.19)
4) Move the TG-1 arm assembly⓮in a direction of the arrow Ⓐ to put the pin ⓯into the concave of the arm assembly ⓱. (Fig. 17)
5) put the pin⓰of the S ratchet⓲into the right side the of the arm assembly⓱. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ❽ With the arm arc portion of the guide arm T assembly❿ (Fig. 15) to push the LS chassis assembly ❼ in a direction of the arrow Ⓔ, and at the same time, engage the claws of the guide rail base 1⓫, guide rail base 2⓬and guide rail base3⓭with those of the guide rail S㉖ and guide rail T㉗. (Fig. 16)

Then, align the shafts ❾ of the mechanical chassis With the four long joints of the LS chassis assembly ❼, and put the LS pin⓴of the LS arm assembly㉑in the groove of the LS cam plate㉒. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ❺ and three screws ❻.
7) Mount the flexible rotary shaft ❸ and flexible connector ❹.
8) Select the USE mode.
9) Mount the arm assy gear ❷ and fix with the lock washer ❶.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

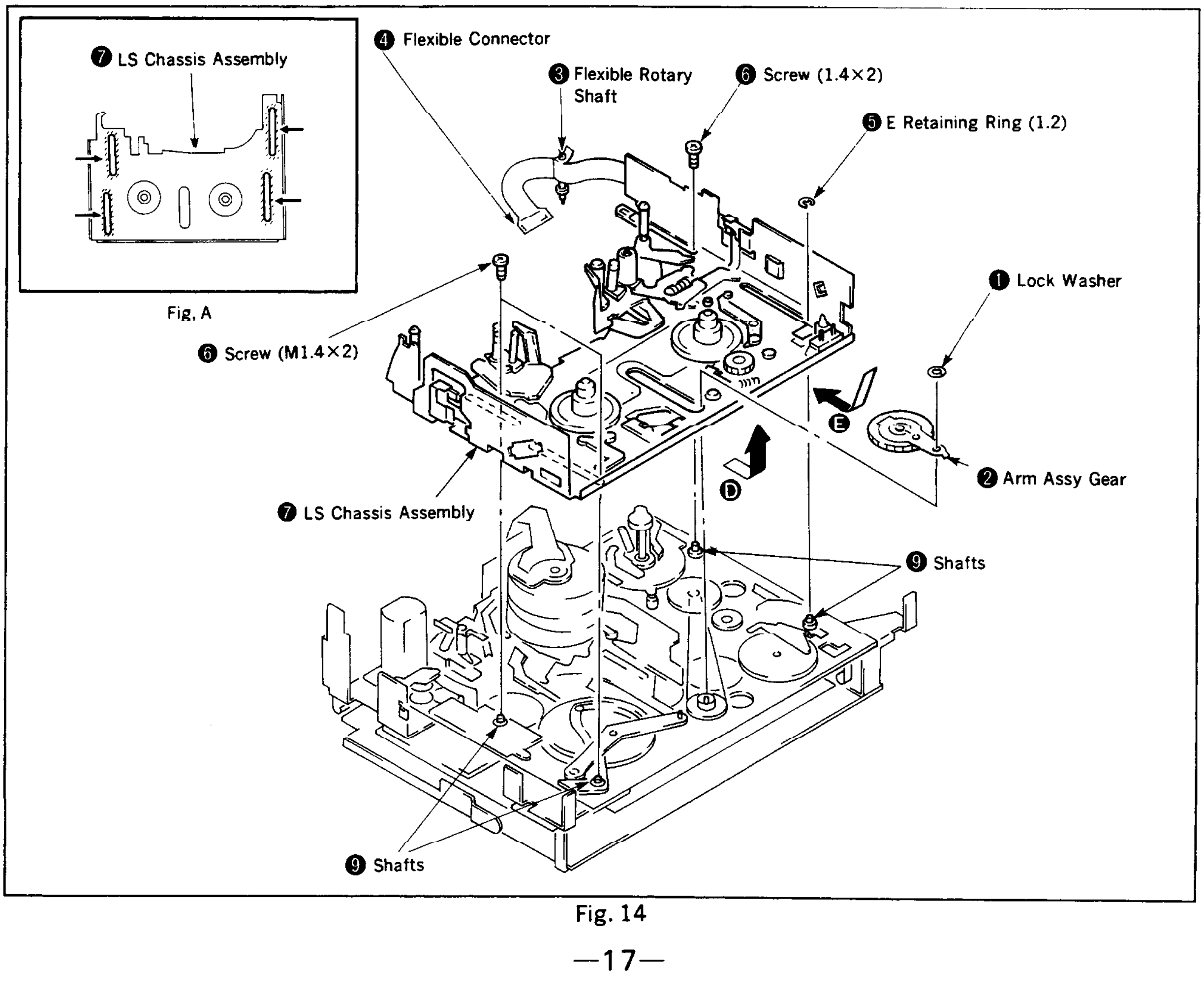


Fig. 14

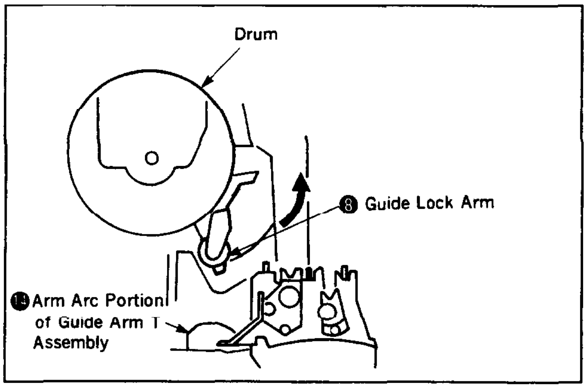

Drum
⑧ Guide Lock Arm
⑭ Arm Arc Portion of Guide Arm T Assembly

Fig. 15

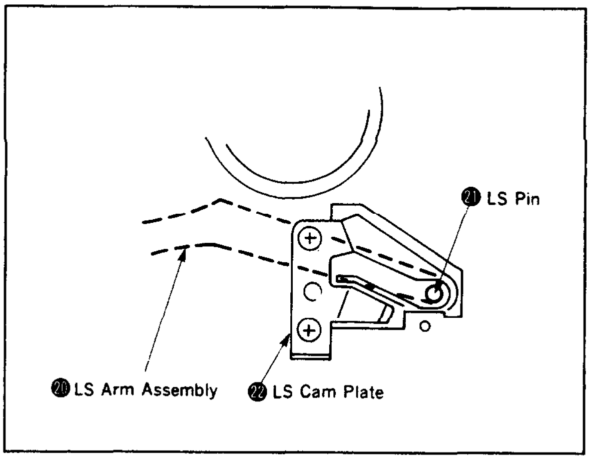

㉑ LS Pin
⑳ LS Arm Assembly
㉒ LS Cam Plate

Fig. 18

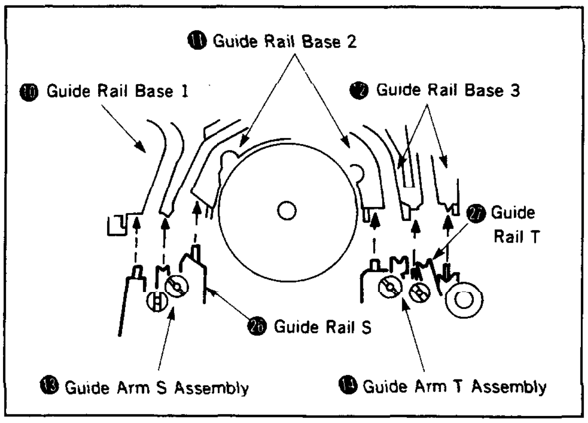

⑪ Guide Rail Base 2
⑩ Guide Rail Base 1
⑫ Guide Rail Base 3
㉗ Guide Rail T
㉖ Guide Rail S
⑬ Guide Arm S Assembly
⑭ Guide Arm T Assembly

Fig. 16

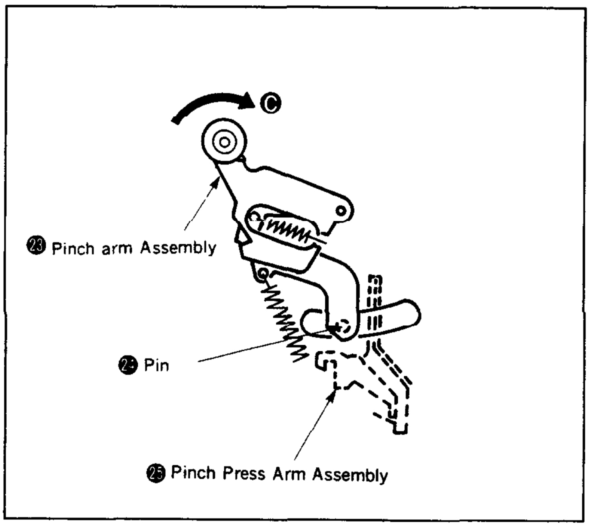

Ⓒ
㉓ Pinch arm Assembly
㉔ Pin
㉕ Pinch Press Arm Assembly

Fig. 19

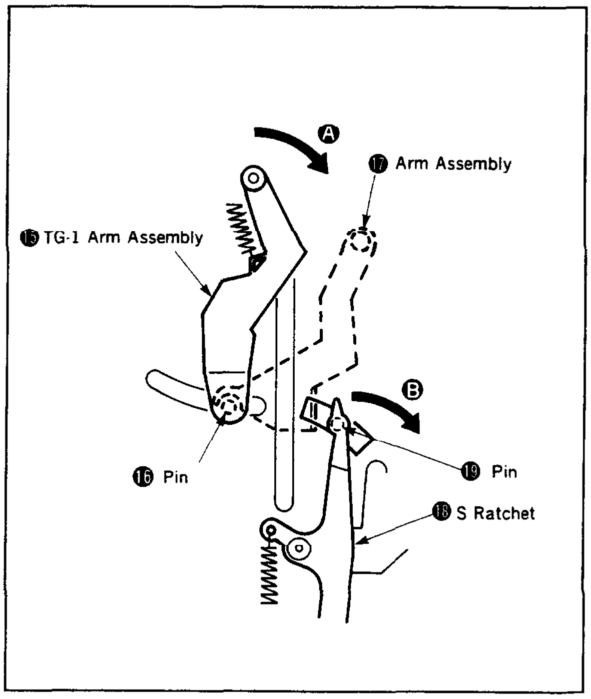

Ⓐ
⑰ Arm Assembly
⑮ TG-1 Arm Assembly
Ⓑ
⑲ Pin
⑯ Pin
⑱ S Ratchet

Fig. 17

3-8 PINCH ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the spring, tension ❸, and then, pinch arm assembly ❹.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❺ over one third of a drip up to half a drip.
2) put the rotation center of the pinch arm assembly in the boss ❺ hole, and the pin ❻ in the long hole.
3) Hook the spring, tension ❸ onto the upper groove of the pinch return spring shaft ❼.
4) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

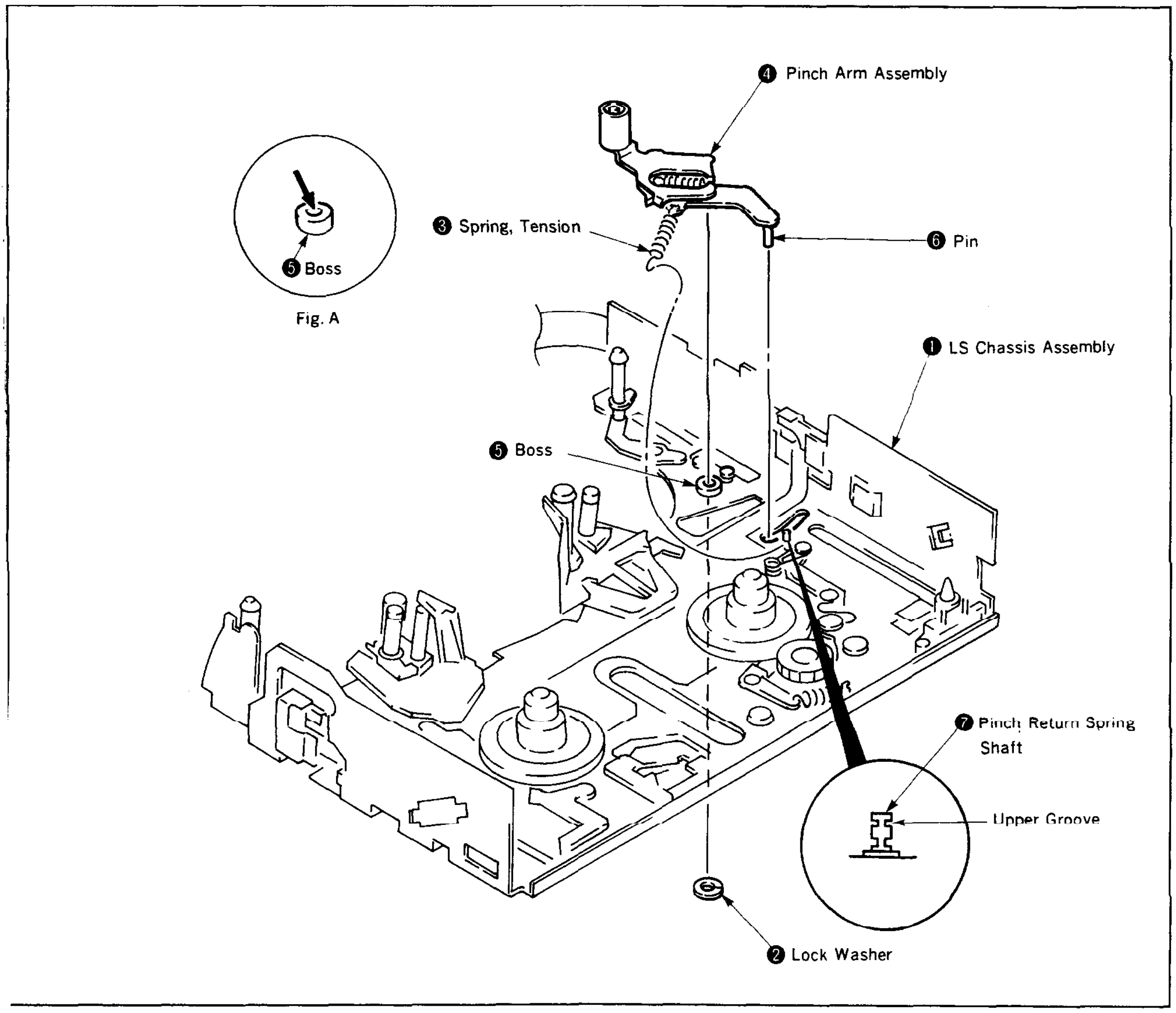

❹ Pinch Arm Assembly
❸ Spring, Tension
❻ Pin
❺ Boss
Fig. A
❶ LS Chassis Assembly
❺ Boss
❼ Pinch Return Spring Shaft
Upper Groove
❷ Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

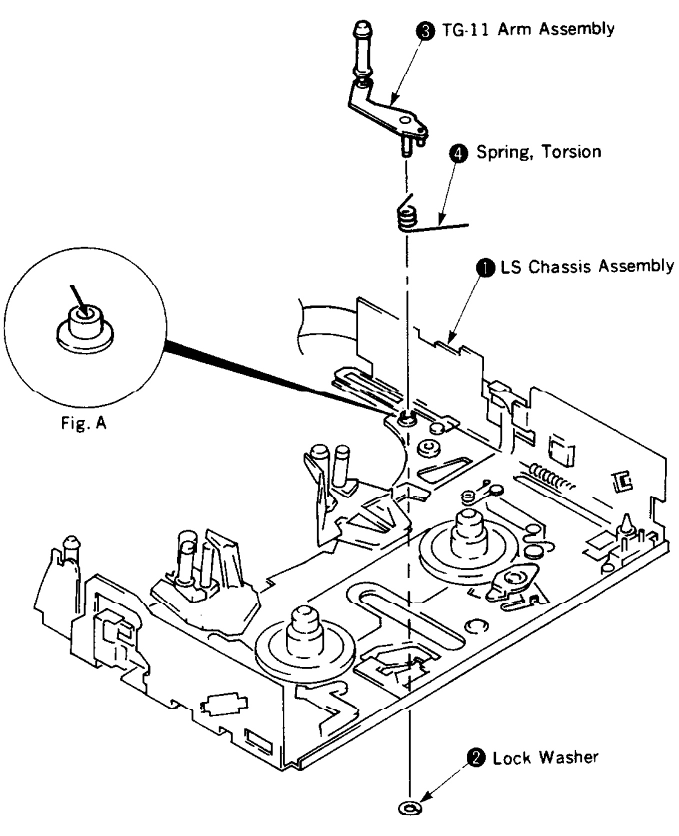

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer

Fig. A

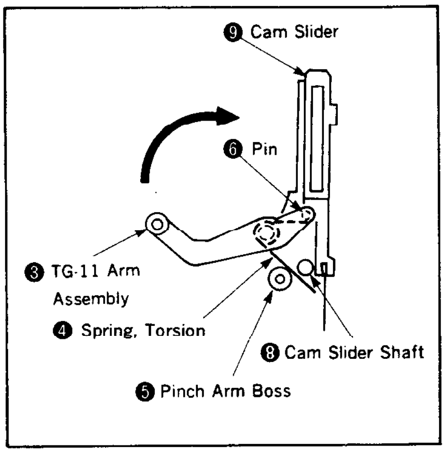

❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss

Fig. B

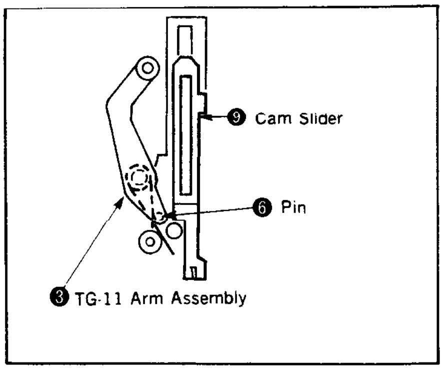

❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly

Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28. adjust a FWD back tension.

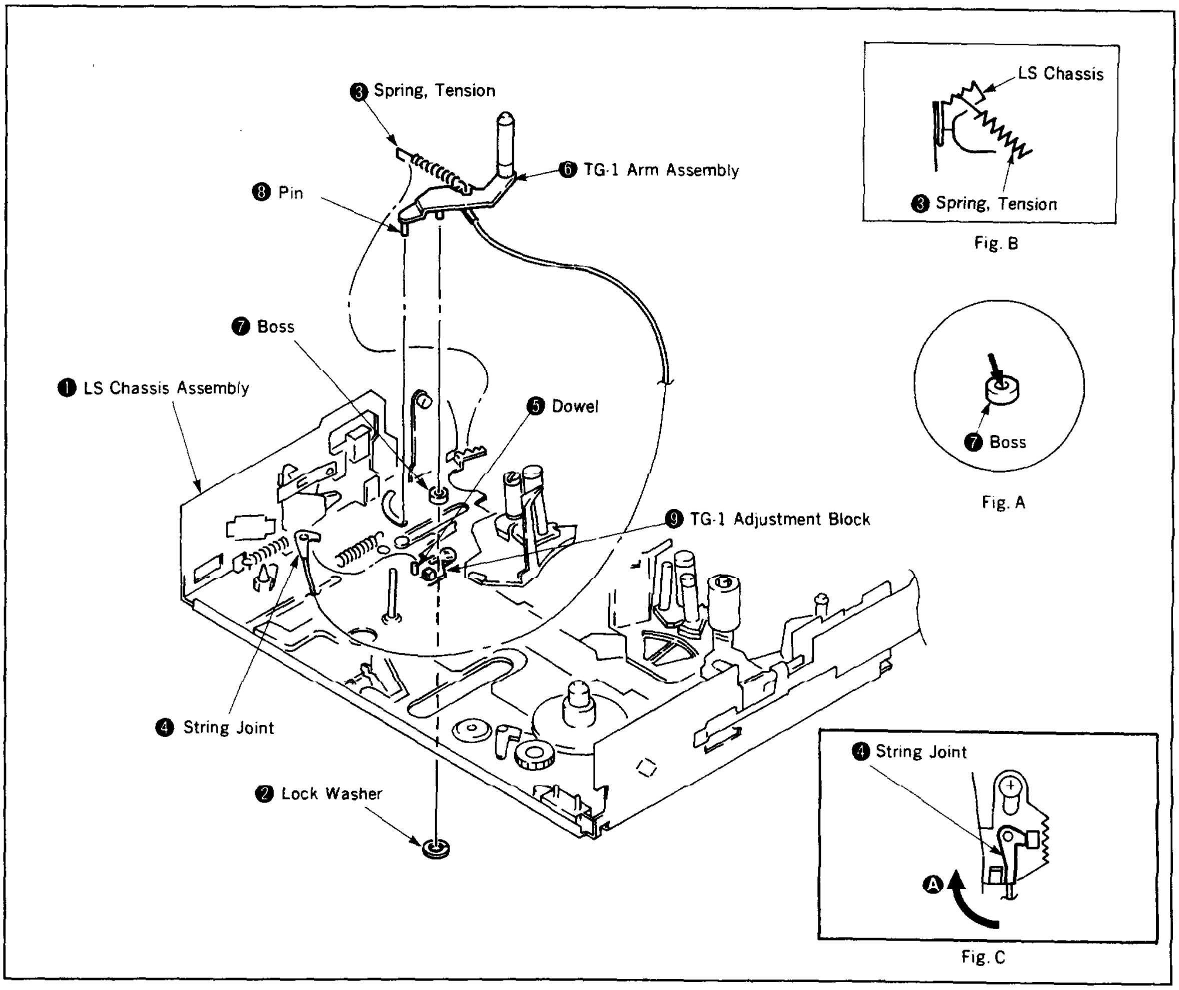

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
Fig. B
❼ Boss
Fig. A
❹ String Joint
Ⓐ
Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ✻.

Note : The joint holder ❷, which was removed once, must not be used again.

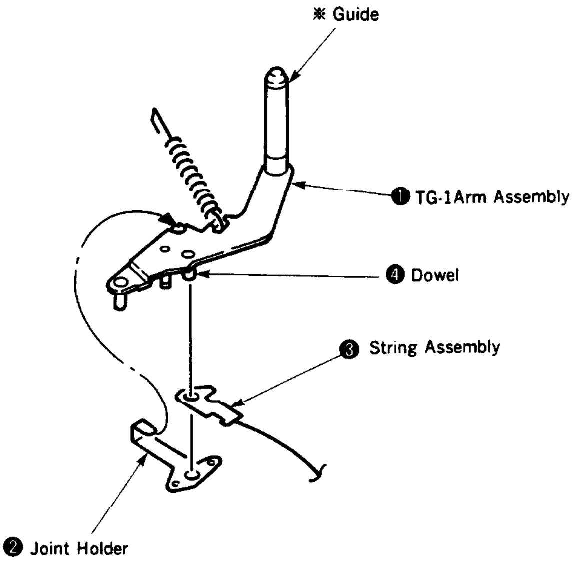

✻ Guide
❶ TG-1Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Rotate the guide arm T assembly ❶ and guide arm S assembly in arrow directions respectively, align their shafts ❸ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ※. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the arrows respectively.
2) Fit the TG-7 base assembly ❺ and TG-9 base assembly ❻ in the grooves of the guide rail T ❹. (Fig. 25)
3) Put the shaft ● flange in the long groove of the guide rail S ❽, and fit the TG-4 base assembly ❾ and TG-6 base assembly ● into the right and left grooves of the guide rail S ❽ respectively.

   When this is done, see to it that the flat spring of the TG-6 base assembly❿ is located below the guide rail S ❽ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

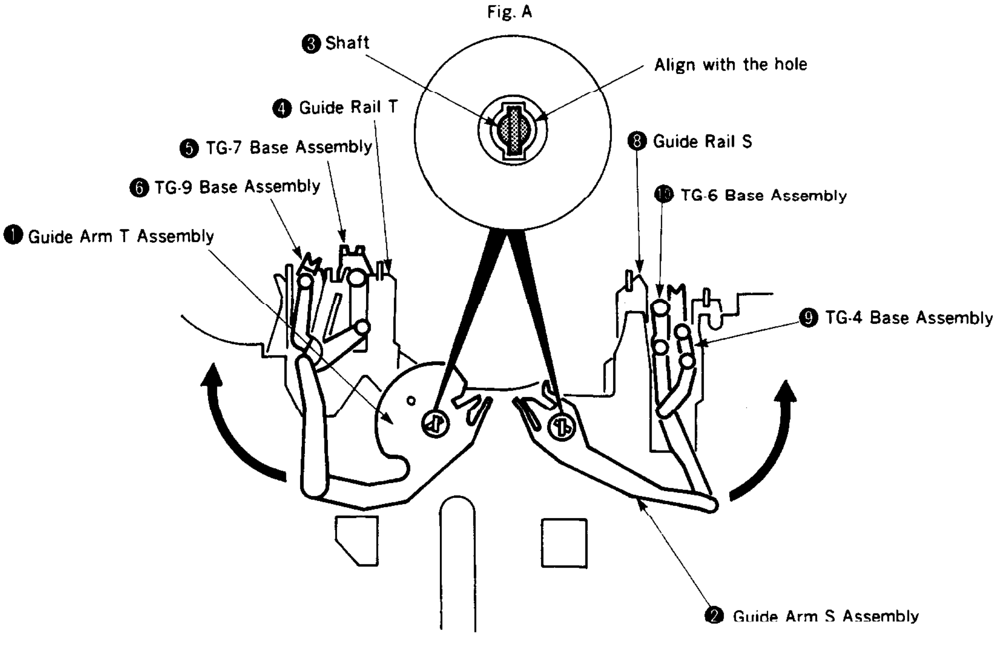


Fig. A
❸ Shaft
Align with the hole
❹ Guide Rail T
❺ TG-7 Base Assembly
❽ Guide Rail S
❻ TG-9 Base Assembly
❿ TG-6 Base Assembly
❶ Guide Arm T Assembly
❾ TG-4 Base Assembly
❷ Guide Arm S Assembly
LS Chassis Assembly Viewed from Back

Fig. 24

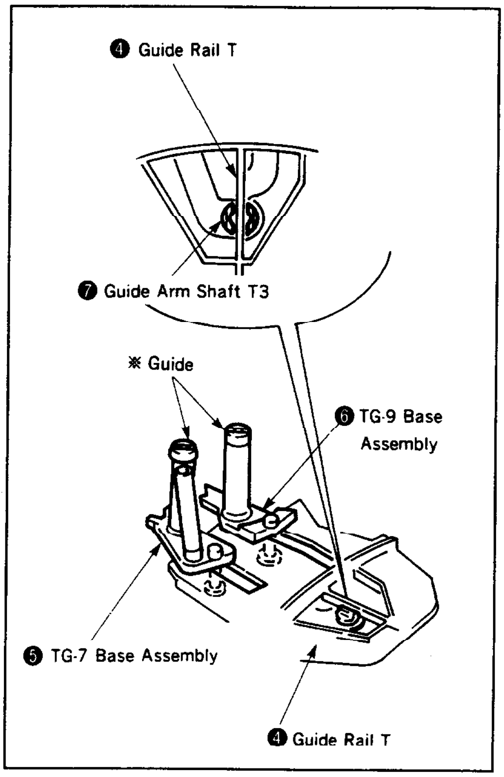

④ Guide Rail T
⑦ Guide Arm Shaft T3
※ Guide
⑥ TG-9 Base Assembly
⑤ TG-7 Base Assembly
④ Guide Rail T

Fig. 25

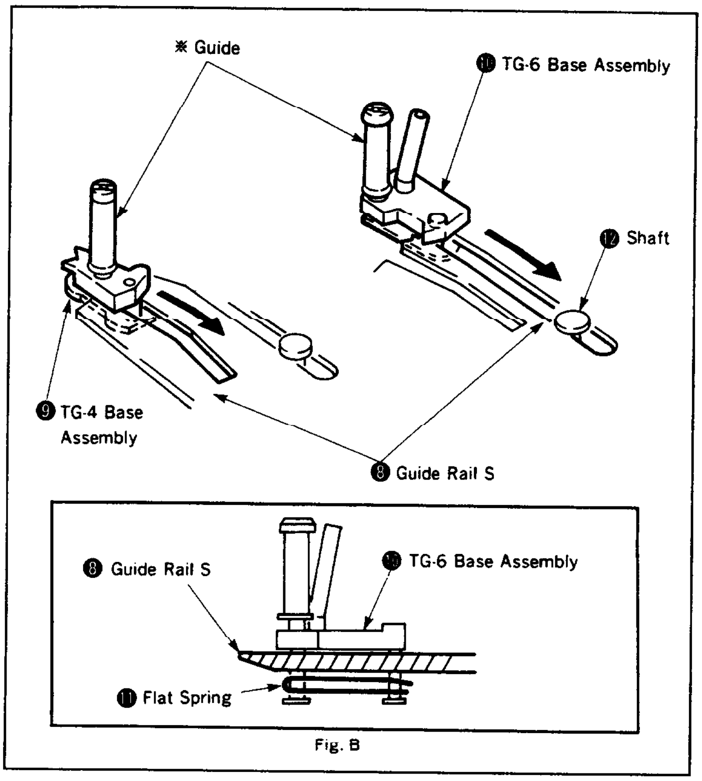

※ Guide
⑩ TG-6 Base Assembly
⑫ Shaft
⑨ TG-4 Base Assembly
⑧ Guide Rail S
⑧ Guide Rail S
⑩ TG-6 Base Assembly
⑪ Flat Spring

Fig. B

Fig. 26

3-13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Remove the screw ❶, and then, pinch press arm assembly ❷.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ❷ at 3 places.
3) Put the pin ❹ of the pinch press arm assembly ❷ in the groove of the cam B ❸.
4) Fix. with the screw ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

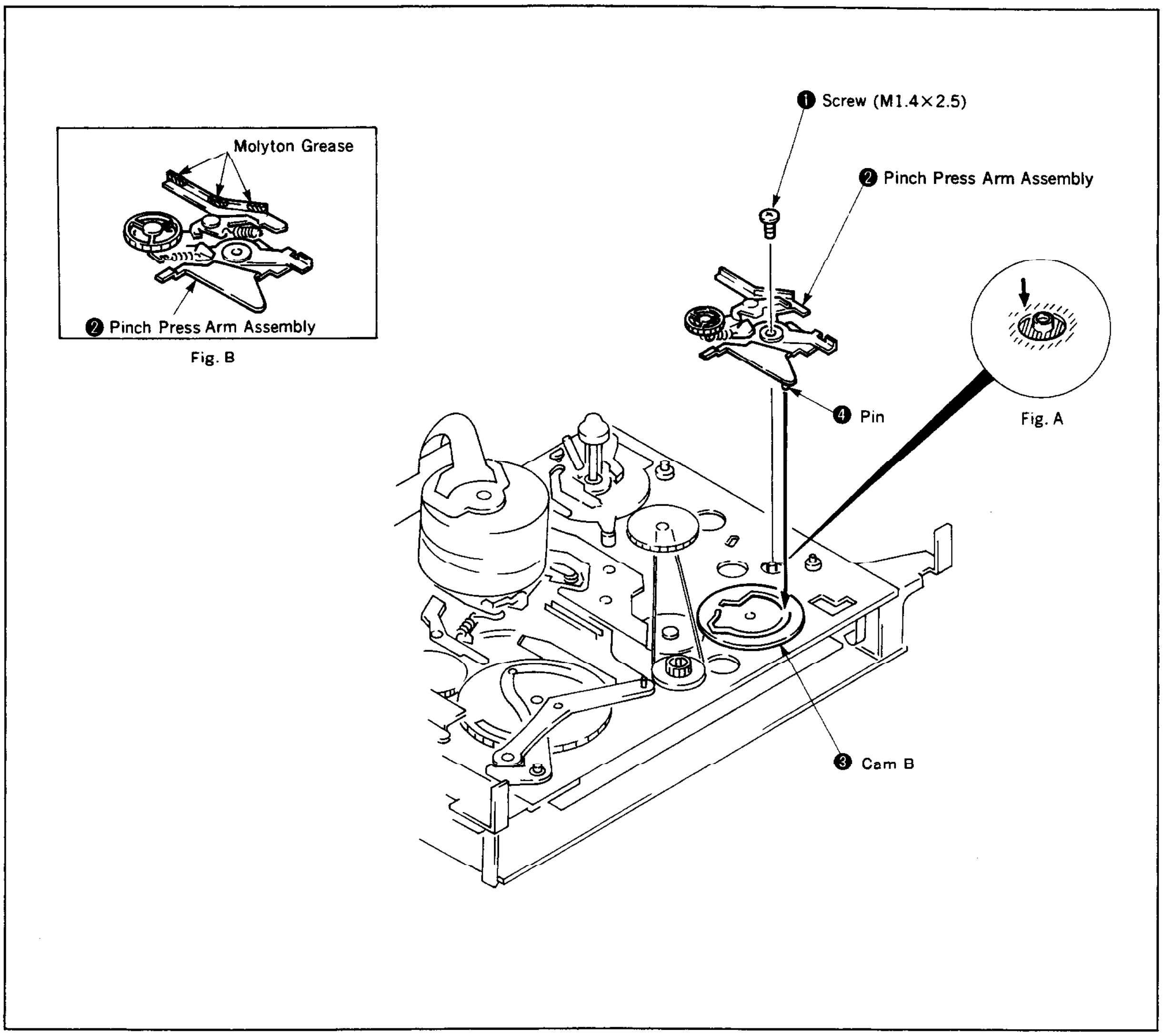

Molyton Grease
❷ Pinch Press Arm Assembly
Fig. B
❶ Screw (M1.4×2.5)
❷ Pinch Press Arm Assembly
❹ Pin
Fig. A
❸ Cam B

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the qroove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ※ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

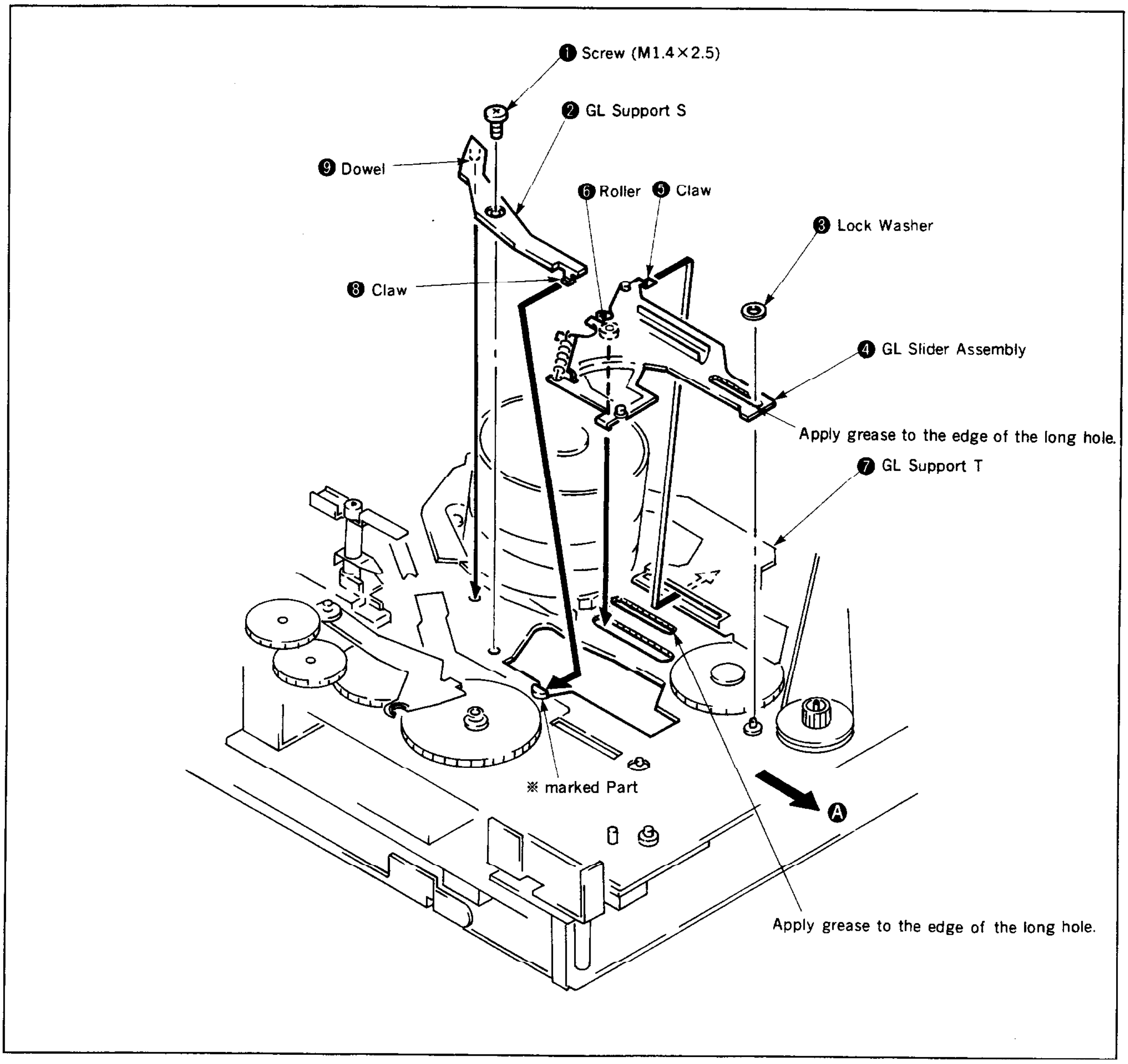

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
※ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

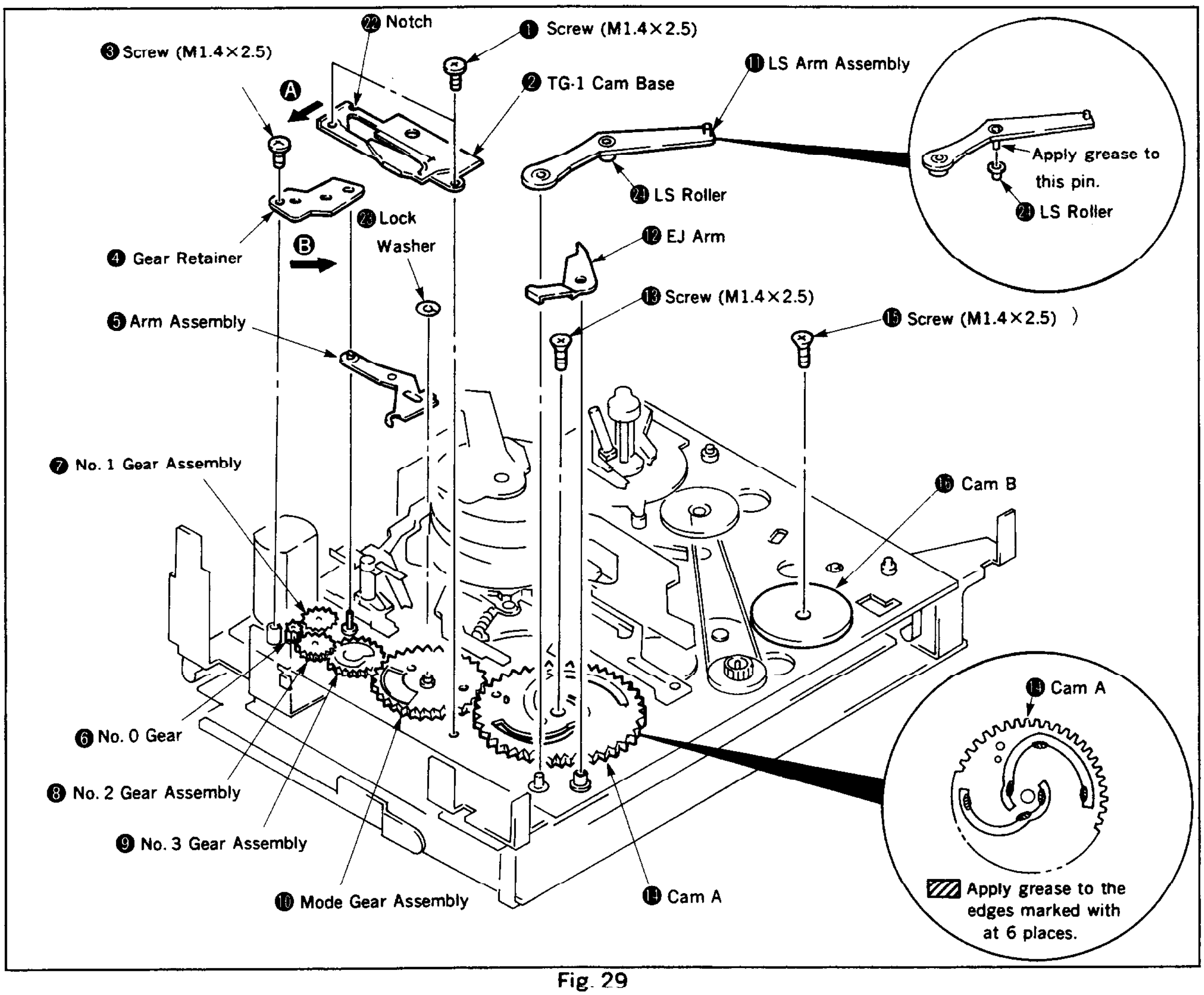
3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ❶, and remove the TG-1 cam base ❷ by moving it in a direction of the arrowⒶ. (Remove the notch ㉒from the groove of the No. 3 gear shaft.)
4) Remove the screw ❸, and remove the gear retainer ❹ by sliding it in a direction of the arrowⒷ.
5) Remove the arm assembly ❺, No. 0 gear ❻, No. 1 gear assembly ❼, No. 2 gear assembly ❽, No. 3 gear assembly ❾, lock washer㉓, and then, mode gear assembly❿, respectively.
6) Being careful not to lose the LS roller㉑of the LS arm, remove the LS arm assembly⓫and EJ arm⓬, respectively.
7) Remove the screw⓭, and then, cam A⓮.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw⓯, and then, cam B⓰.

2. Adjustment and Mounting

1) Face the holeⓐ of the mode gear assembly❿to a direction of the arrowⒶ, move the GL slider assembly⓱in a direction of the arrowⒷ, apply molyton grease to the pin of the GL slider assembly⓱, and mount the LS roller㉑. (Fig. 30)
2) Set a direction of the cam A⓮so that the holeⓒ of the cam A ⓮will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider⓱so that the LS roller㉑will be placed into the grooveⓓ of the cam A⓮. At the same time, engage the mode gear assembly❿with the gear of the relay gear A⓲, and mount the cam A⓮. Insert a stick of about ϕ1.5mm in the hole ⓒ of the cam A⓮. (Fig. 31)
4) Align the holeⓔof the cam B⓰with the hole of the mechanical chassis. At the same time, engage the relay gear B⓳ with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the holeⓕ of the No. 3 gear assembly ❾ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly❿with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ❽, No. 1 gear assembly ❼ and No. 0 gear ❻ in that order. Mount the arm assembly ❺ to the shaft and put the pin⓴in the groove of the No. 3 gear assembly ❾, (Fig. 34)
8) Put the TG-1 cam base ❷ in place, fit the notch㉒to the shaft and shift it in an arrow direction, and mount the screws ❶ and ❶ in that order. (Fig. 35)
9) Put the gear retainer ❹ in place, slide it in an arrow direction and fix it with the screw ❸. (Fig. 36)
10) Seeing to it that the EJ arm⓬and the LS roller㉑of the LS arm assembly⓫are put in the grooveⓖof the cam A⓮, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.



㉒ Notch
❶ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
Ⓐ
❷ TG-1 Cam Base
⓫ LS Arm Assembly
Apply grease to this pin.
㉑ LS Roller
㉑ LS Roller
㉓ Lock Washer
❹ Gear Retainer
Ⓑ
⓬ EJ Arm
⓭ Screw (M1.4×2.5)
⓯ Screw (M1.4×2.5)
❺ Arm Assembly
❼ No. 1 Gear Assembly
⓰ Cam B
⓮ Cam A
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly
❿ Mode Gear Assembly
⓮ Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

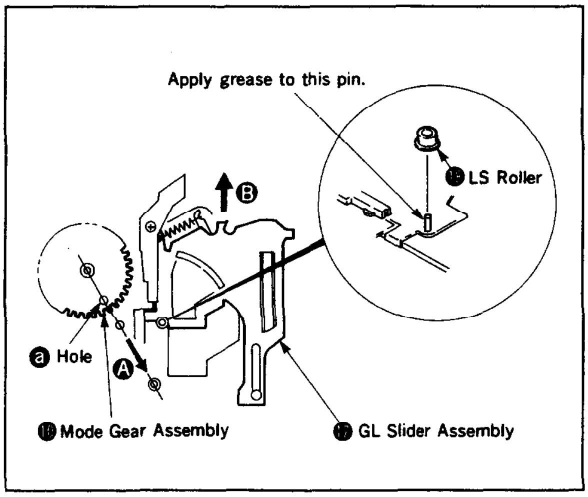

Apply grease to this pin.
⓲ LS Roller
Ⓑ
ⓐ Hole
Ⓐ
❿ Mode Gear Assembly
⓱ GL Slider Assembly

Fig. 30

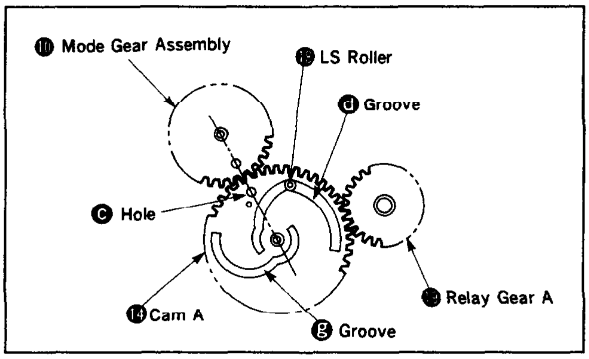

❿ Mode Gear Assembly
⓲ LS Roller
ⓓ Groove
ⓒ Hole
⓳ Relay Gear A
⓮ Cam A
ⓖ Groove

Fig. 31

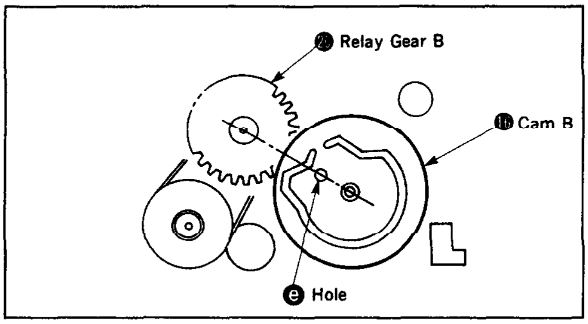

⓴ Relay Gear B
⓰ Cam B
ⓔ Hole

Fig. 32

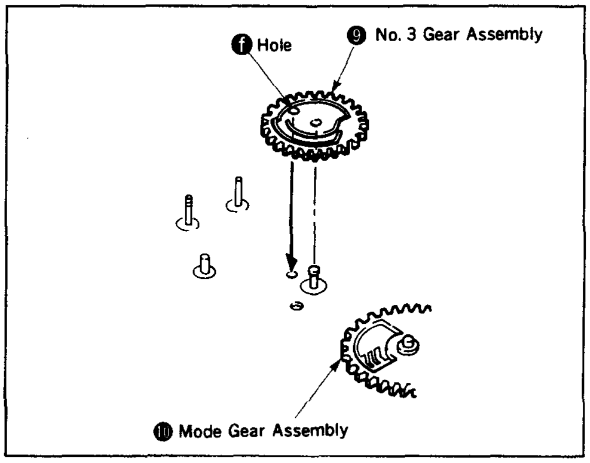

ⓕ Hole
❾ No. 3 Gear Assembly
❿ Mode Gear Assembly

Fig. 33

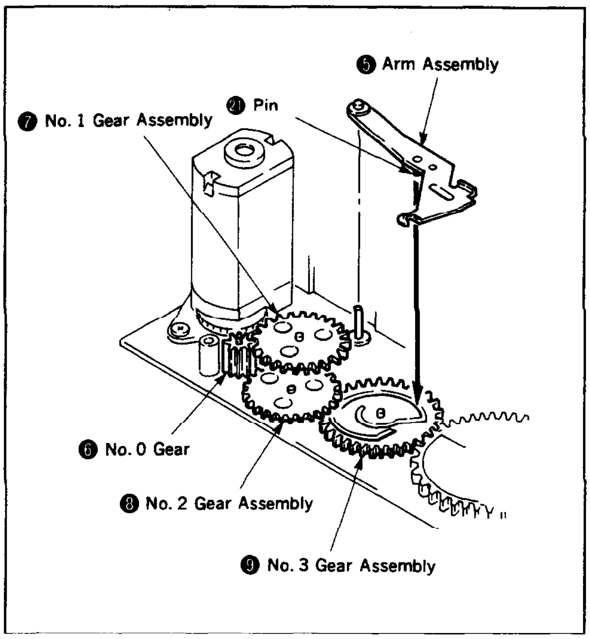

❺ Arm Assembly
❼ No. 1 Gear Assembly
㉑ Pin
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly

Fig. 34

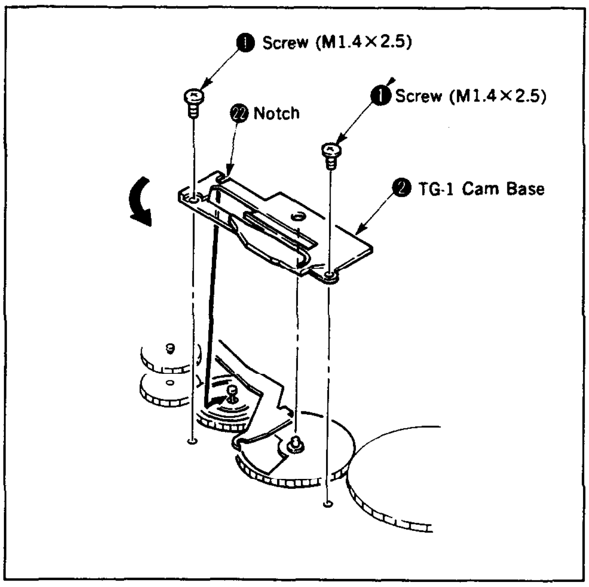

❶ Screw (M1.4×2.5)
❶ Screw (M1.4×2.5)
㉒ Notch
❷ TG-1 Cam Base

Fig. 35

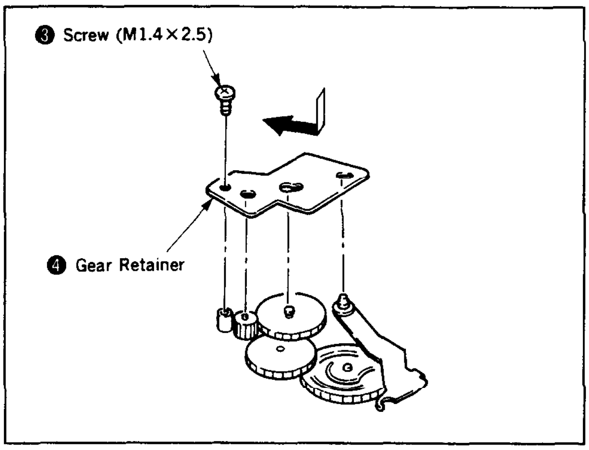

❸ Screw (M1.4×2.5)
❹ Gear Retainer

Fig. 36

3-16 GEAR TRAIN OPERATION CHECK (Fig. 37)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-17, remove the loading motor.

2. Check

1) Insert the tip of tweezers into the hole a of the cam A ❶.
2) Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.
3) When this is done, check that each, gear, the GL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.
4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

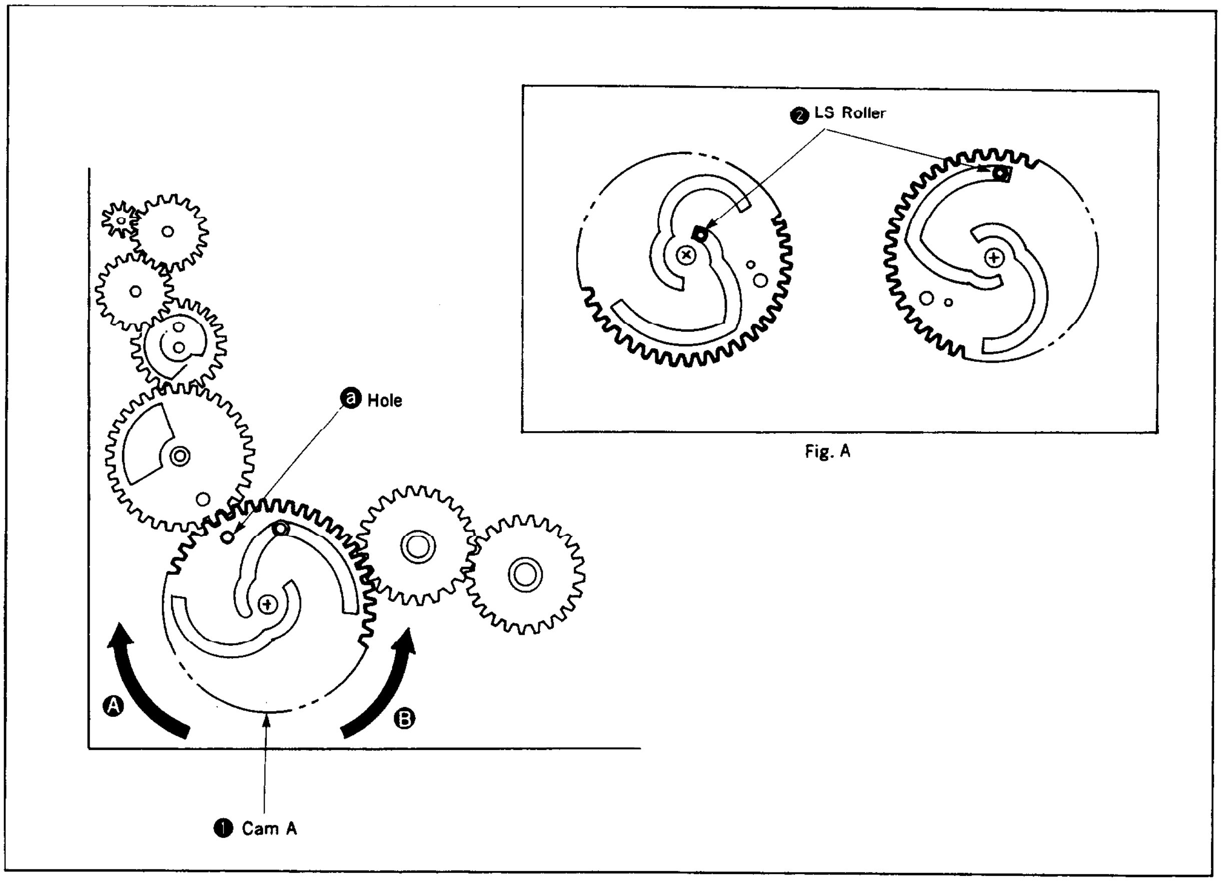


Fig. A

Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

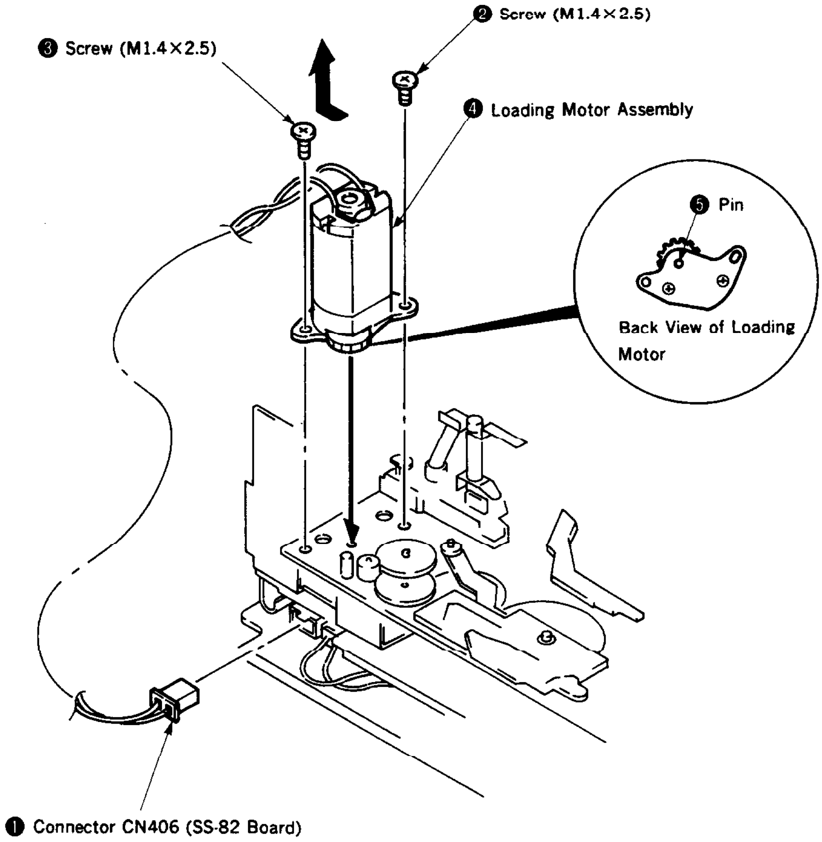

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ●, and then, guide rail base 1 assembly ●.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ●. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ● of the guide rail base 1 assembly ● in the notch of the chassis, and tighten the two screws ● with a torgue of 0.6kg•cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ● with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

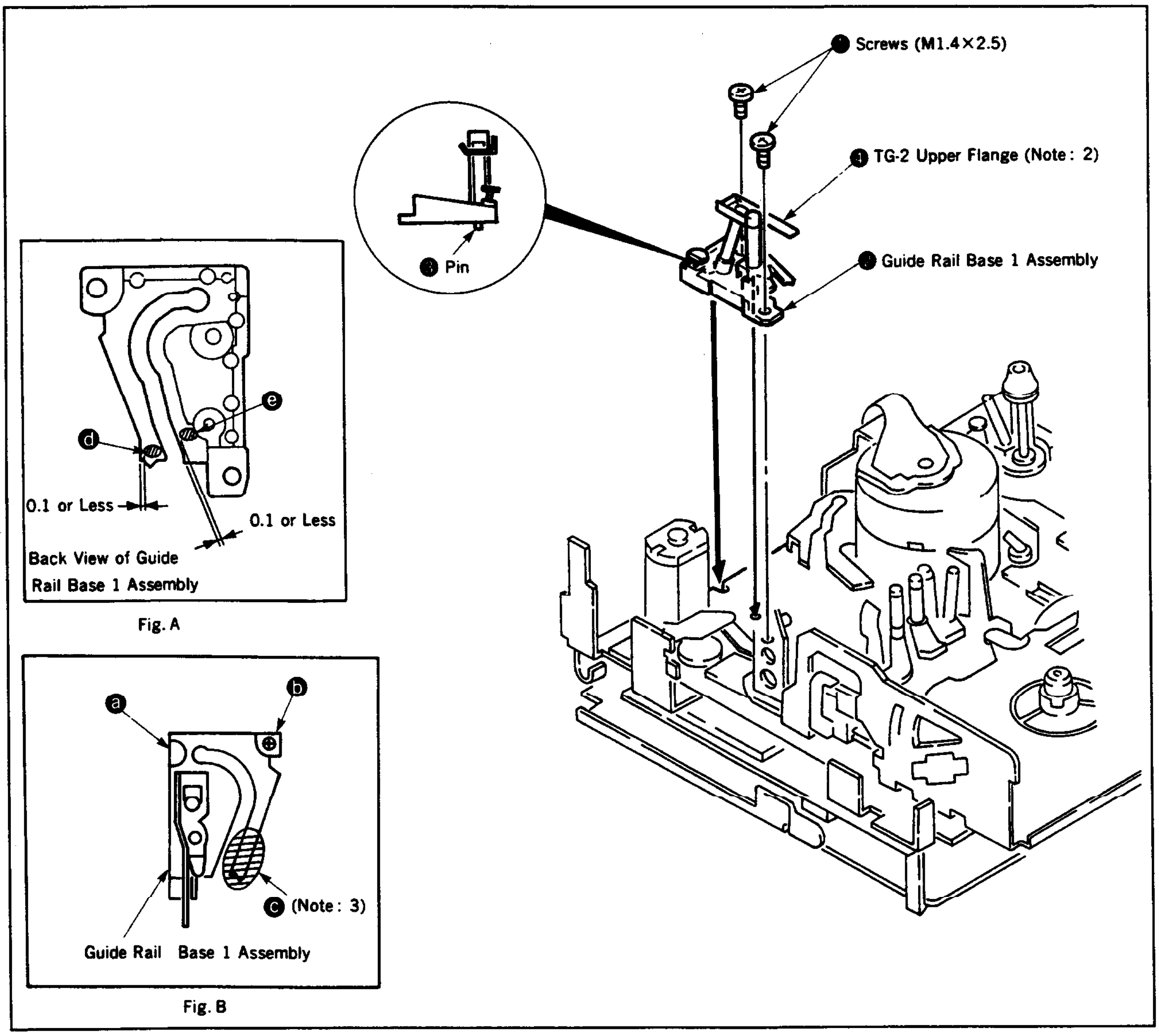

● Screws (M1.4×2.5)
● TG-2 Upper Flange (Note: 2)
● Guide Rail Base 1 Assembly
● Pin
ⓓ
ⓔ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
ⓐ
ⓑ
ⓒ (Note: 3)
Guide Rail Base 1 Assembly

Fig. A

Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ❶, and then, frame B assembly ❷ in a direction of the arrowⒶ.
4) Unskate the LS chassis a little.
5) Remove the two screws ❸, and then, guide rail base 2 assembly ❹ in a direction of the arrowⒷ.

Note: Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ❹ to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ✻ of the guide rail base 2 assembly ❹ lightly in a direction of ⓔ (Fig. B), tighten the two screws ❸ with a torque of 0.8kg•cm.

Note: Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ❶.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

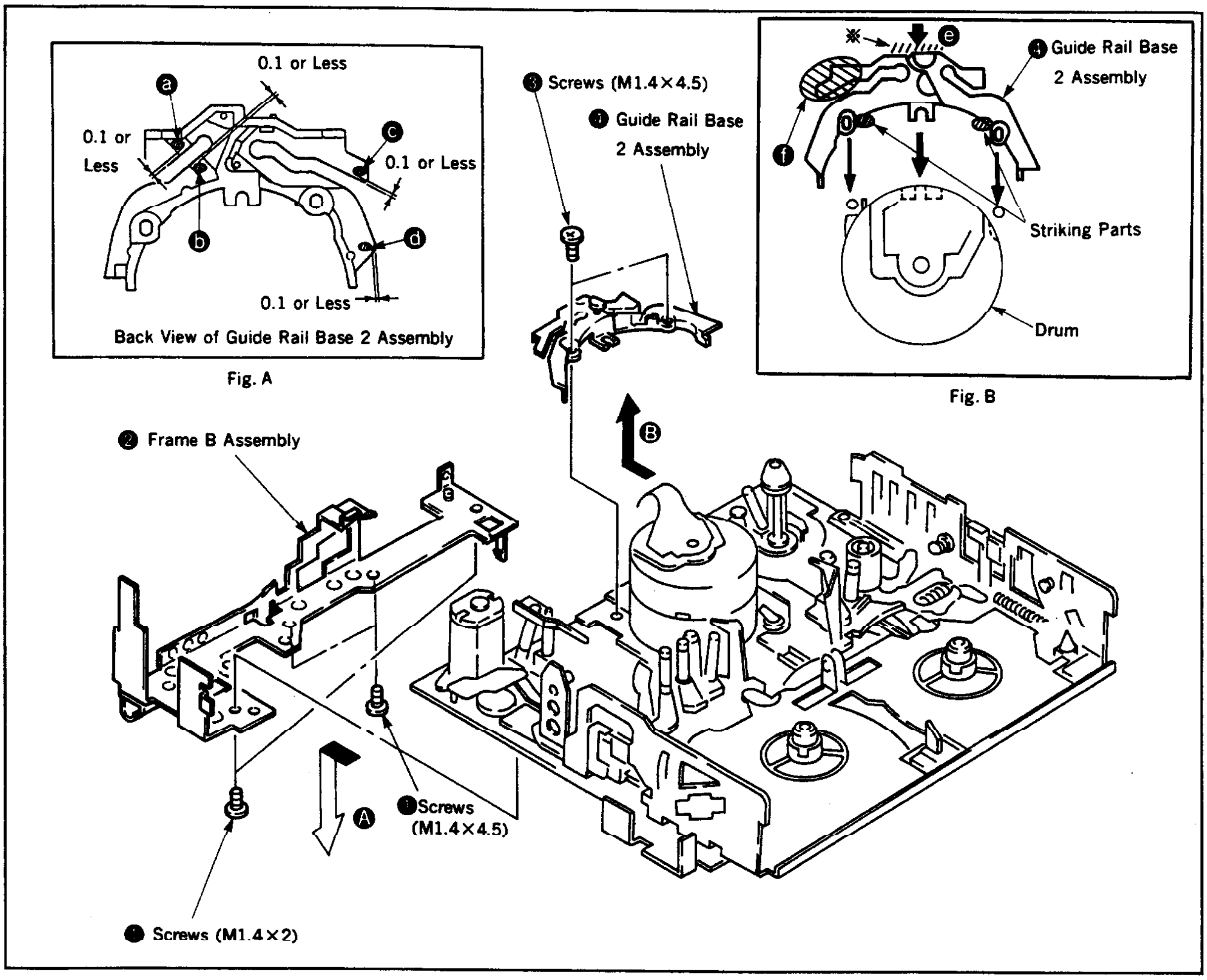

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
Fig. A
❸ Screws (M1.4×4.5)
❹ Guide Rail Base 2 Assembly
✻
ⓔ
❹ Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Fig. B
Ⓑ
❷ Frame B Assembly
Ⓐ
❶Screws (M1.4×4.5)
❶ Screws (M1.4×2)

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ●.
3) Remove the two screws ●. Remove the guide rail base 3 assembly ● in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ✻ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ●. (Fig. A)
2) Mount the guide rail base 3 assembly ●, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ● with a torque of 0.6kg•cm.
4) Mount the flexible rotary shaft ●.
5) Referring to 1-1, mount the cassette compartment holder assembly.

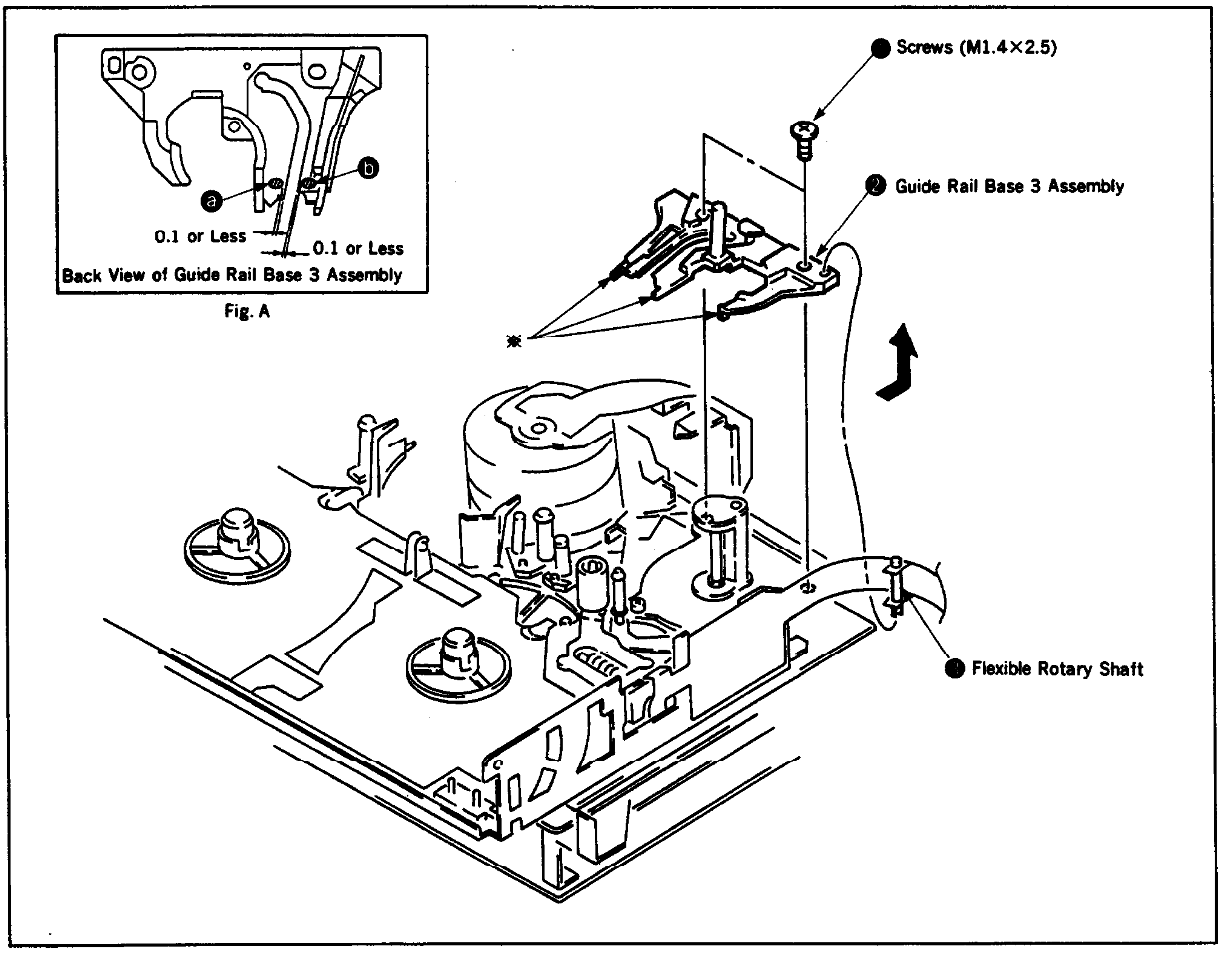

ⓐ
ⓑ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
● Screws (M1.4×2.5)
❷ Guide Rail Base 3 Assembly
✻
● Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ● of the capstan motor assembly ●.
4) Remove the screw ●. Disengaging the gear of the conversion gear assembly ●, remove the capstan motor assembly ● in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ● to engage the gear of the capstan motor assembly ● with that of the conversion gear assembly ●, and tighten the screw 3 with a torque of 1kg•cm.
   When this is done, be careful not to damage the gear of the conversion gear assembly ●.
2) Mount the connector 2 to the capstan motor assembly ●.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

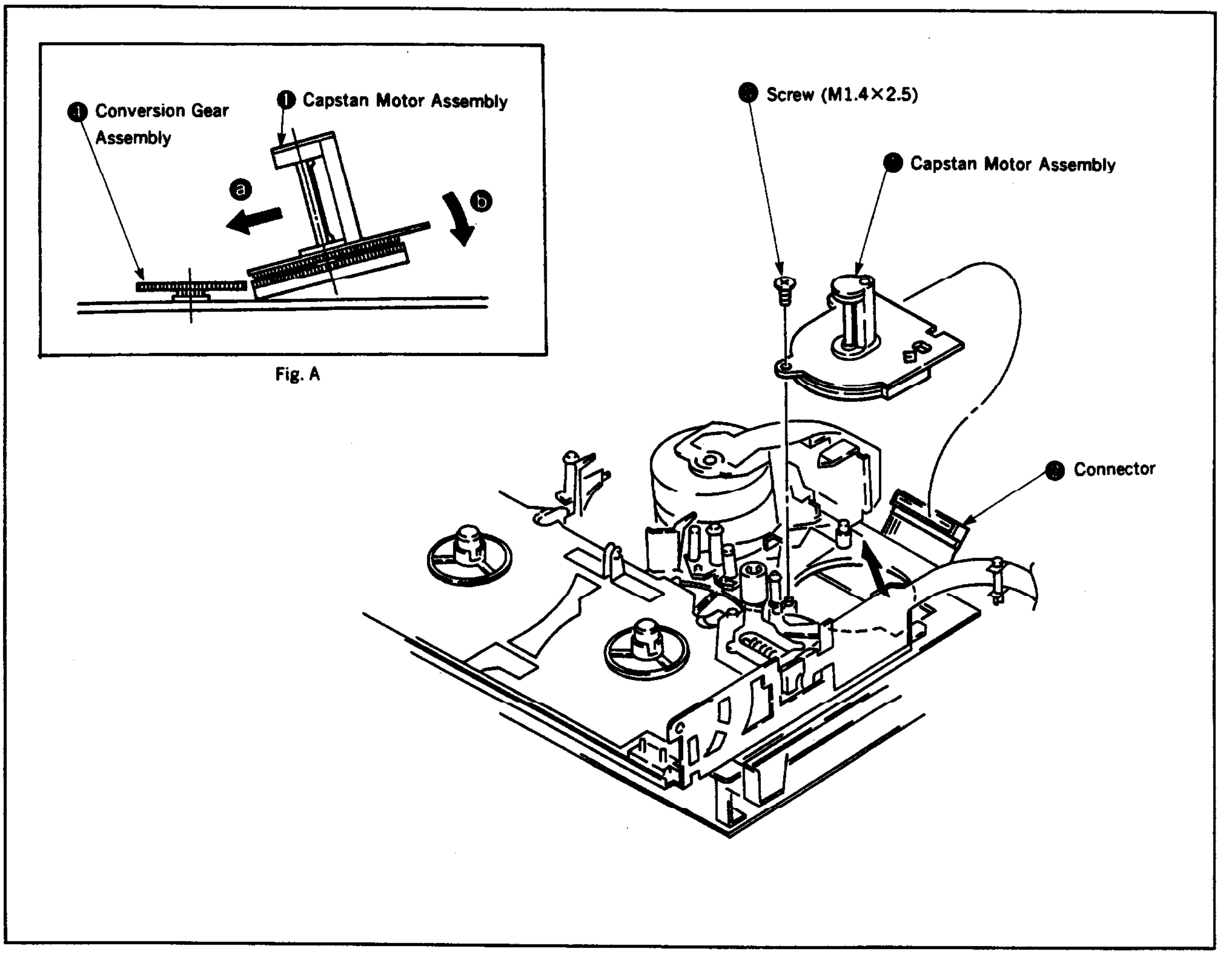

● Conversion Gear Assembly
● Capstan Motor Assembly
ⓐ
ⓑ
● Screw (M1.4×2.5)
● Capstan Motor Assembly
● Connector

Fig. A

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ●.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis and put the positioning pins ● of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ● with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note: After mounting, make tape path adjustment in Section 4.

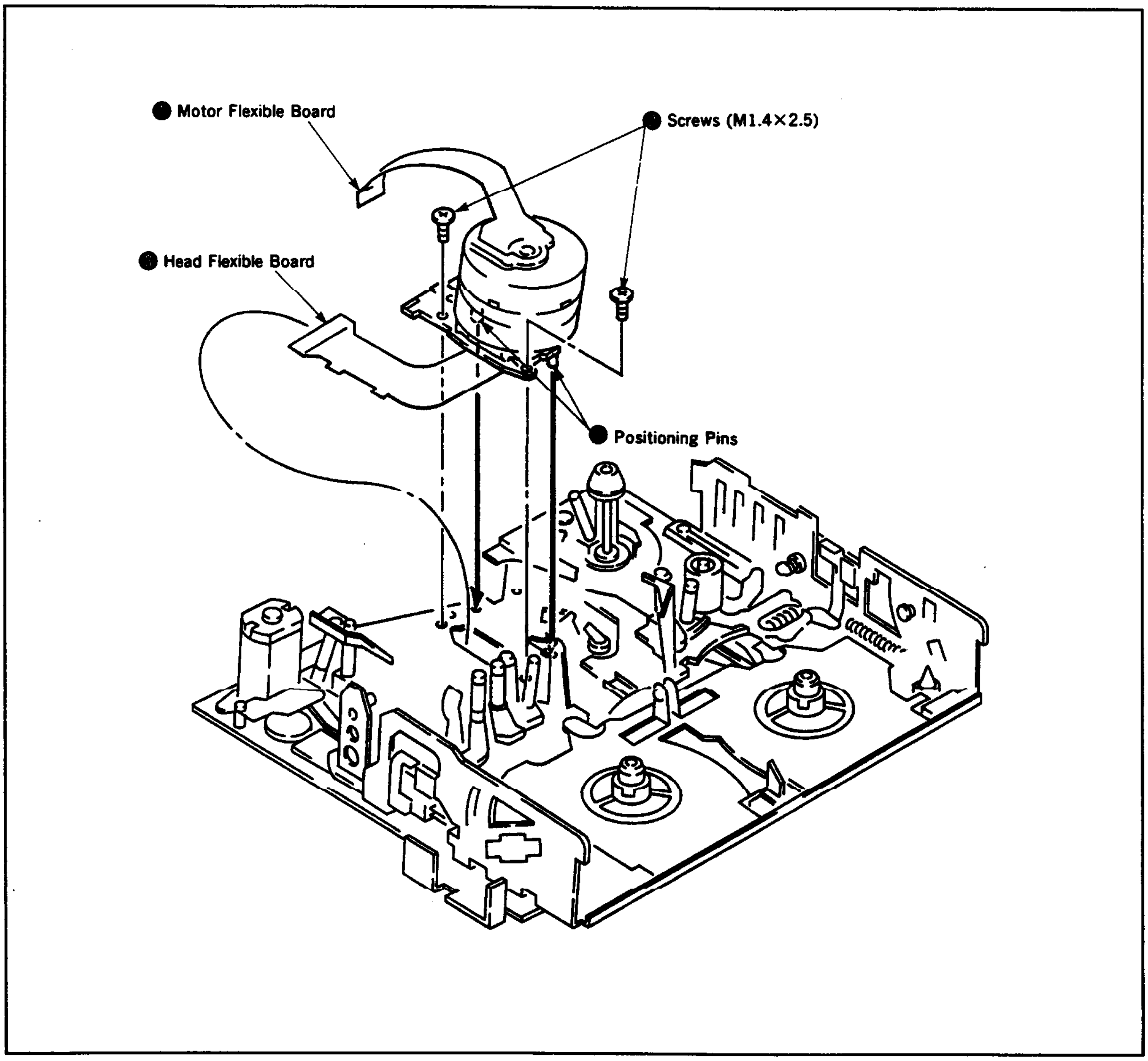


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ● from the back of the mechanical chassis.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ●.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ● with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

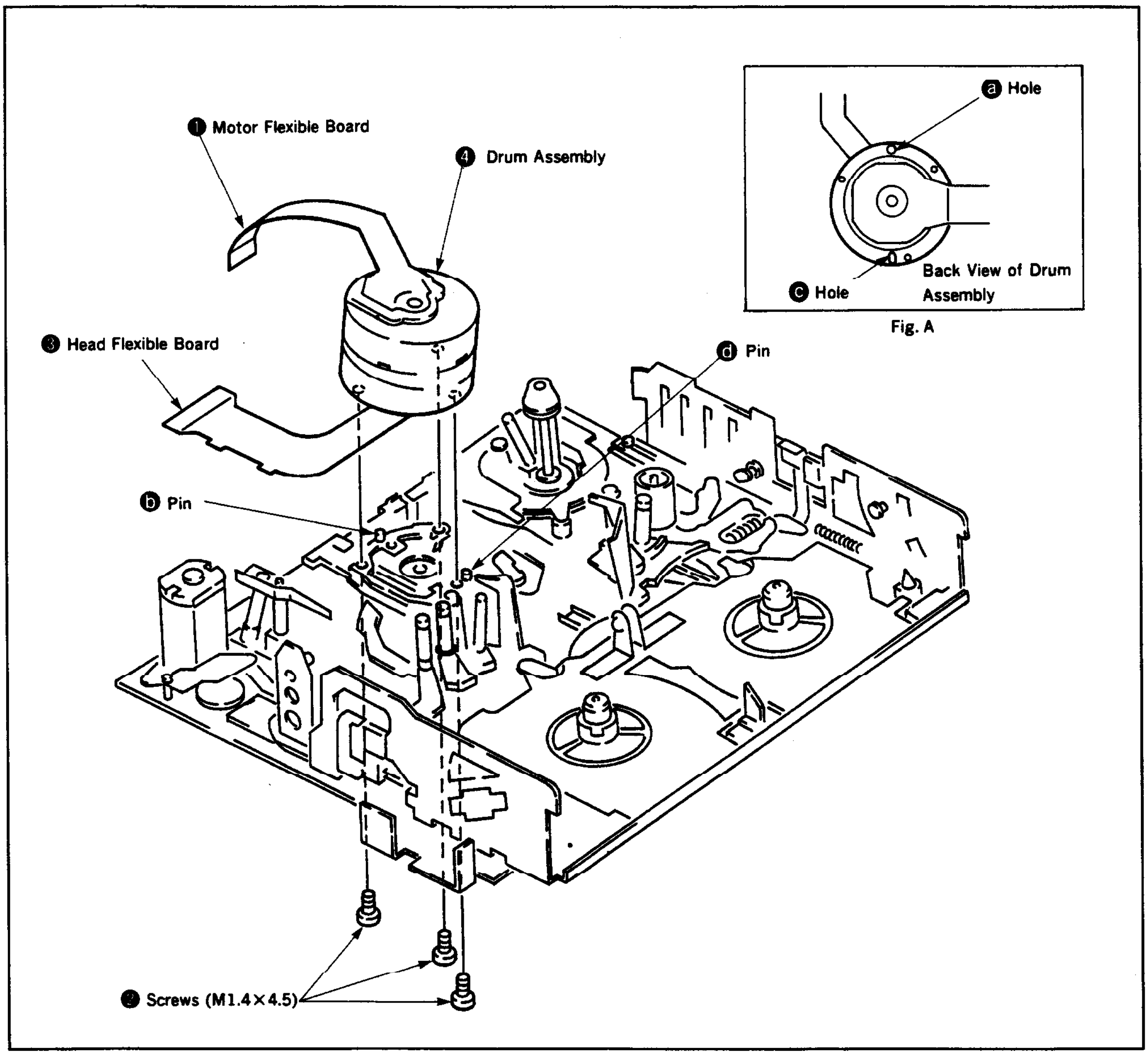
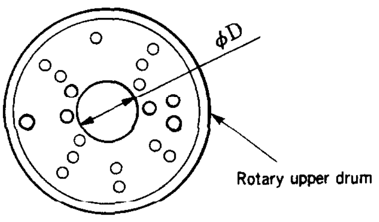

❶ Motor Flexible Board
❹ Drum Assembly
❸ Head Flexible Board
ⓑ Pin
ⓓ Pin
❷ Screws (M1.4×4.5)
ⓐ Hole
ⓒ Hole
Back View of Drum Assembly
Fig. A

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC :

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL :

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ❶. (Fig. 44)
3) Hold the outlet (base) of the guide protector ❷, lift it up obliquely. In that state, hold the outer figure of the back yoke ❸ and remove it. (Fig. 44)

Note : Note that the flexible board and guide protector ❷ easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ❹ around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❺, and then, rotary upper drum assembly ❻. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❼, and then, rotor ❽. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface❿and the surface of the rotary upper drum assembly ❻ which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin⓫will be put in the reference hole of the rotary upper drum assembly ❻, and push it in lightly. (Fig. 45)

Note : Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ❺ (800g·cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ❾ of the rotor ❽ in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ❼. (800g·cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ❹ from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss⓬. (Fig. B in Fig. 45)

Note : See to it that the rotor earth spring ❹ is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ❸, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ❶. (500g·cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note : After mounting, be sure to make tape path adjustment in Section 4.

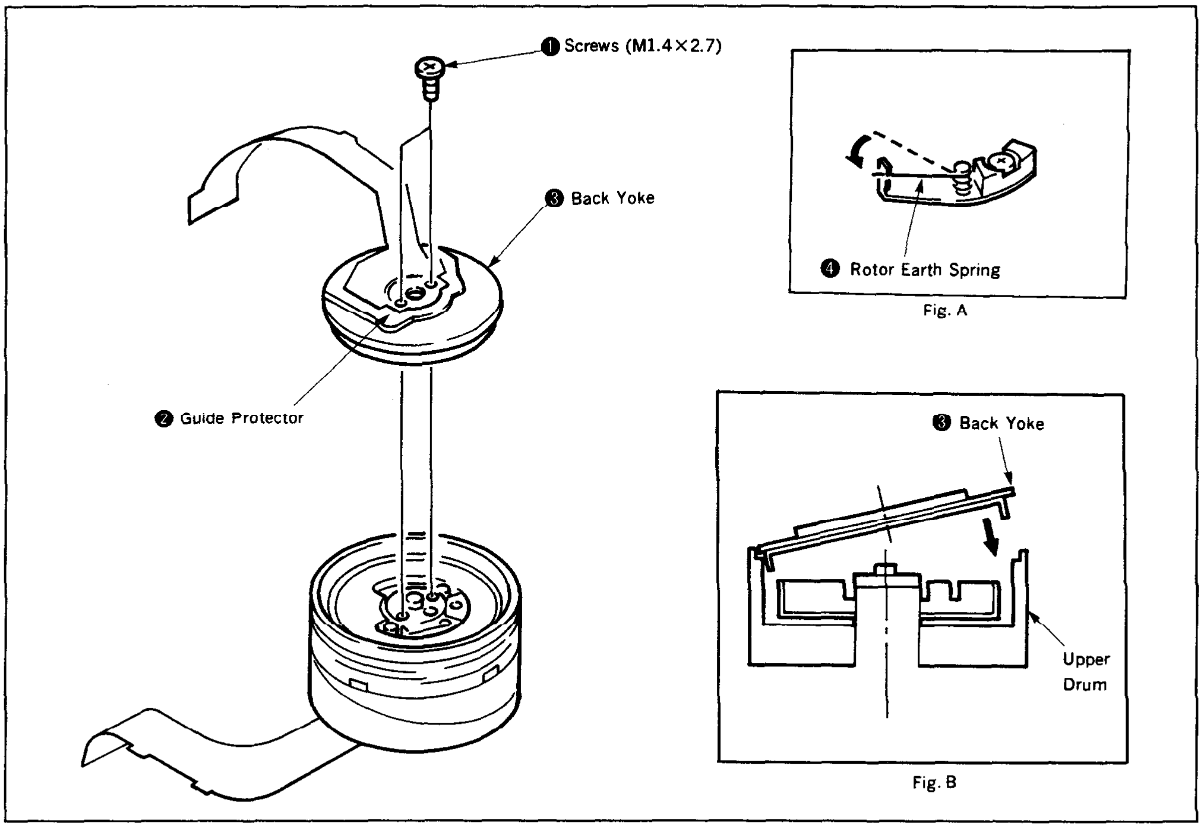

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
❸ Back Yoke
Upper Drum

Fig. A

Fig. B

Fig. 44

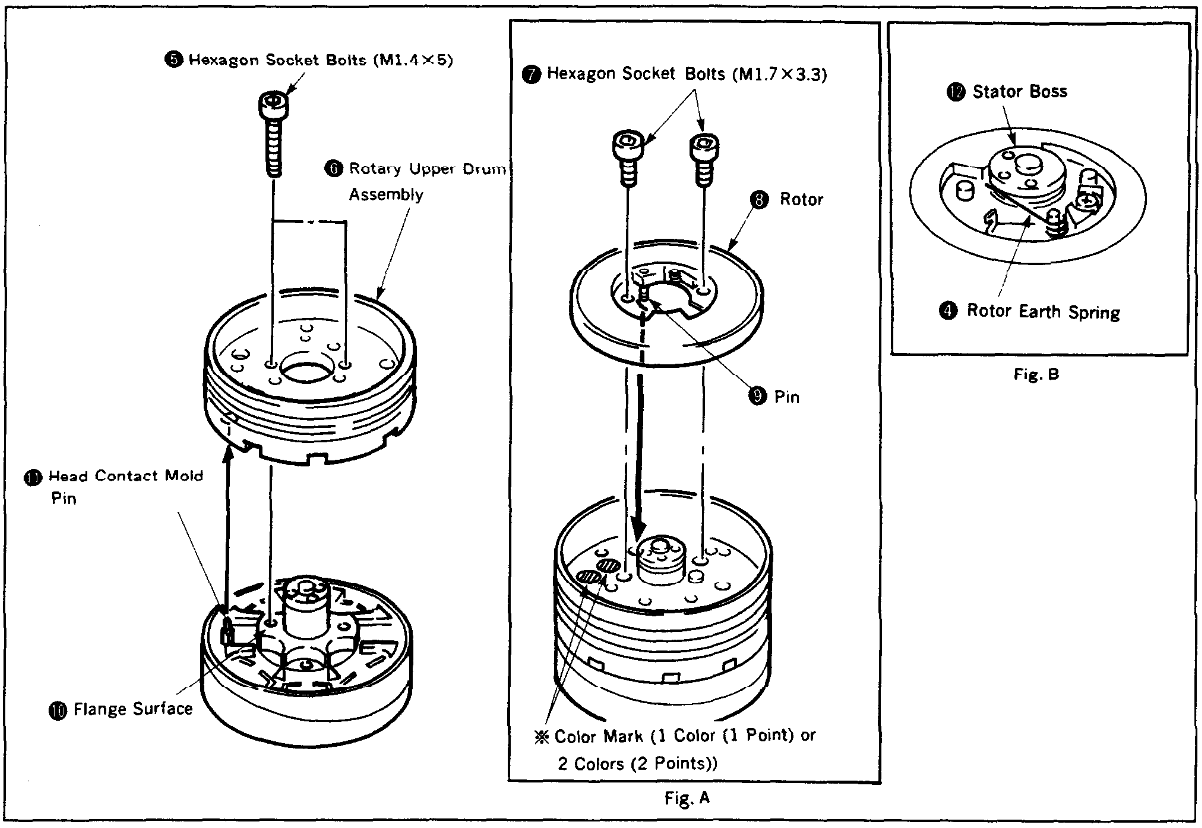

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rotary Upper Drum Assembly
⓫ Head Contact Mold Pin
❿ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
⓬ Stator Boss
❹ Rotor Earth Spring

Fig. A

Fig. B

Fig. 45

3-25 REEL TABLE HEIGHT CHECK (Fig. 46)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-1, remove the LED base.

2. Check

1) Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ② and T reel table reel resting surface ③ are respectively as shown in below.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

A:$3.2^{+0.2}_{-0.15}$mm

B:3.2±0.15mm

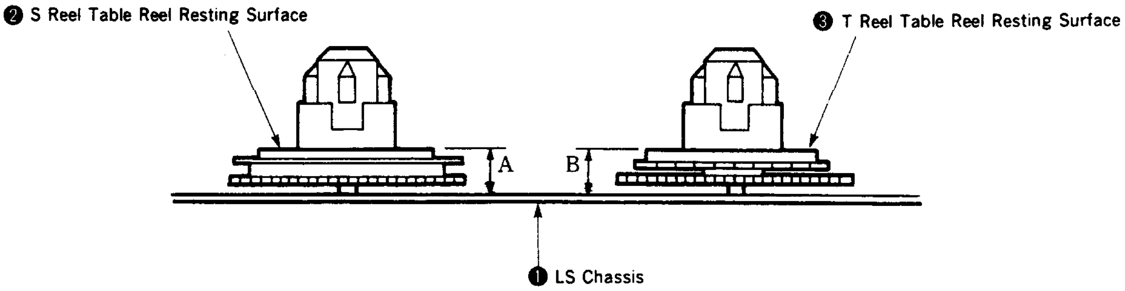

② S Reel Table Reel Resting Surface
③ T Reel Table Reel Resting Surface
A
B
① LS Chassis

Fig. 46

3-26 FWD/RVS TORQUE CHECK

1) Set the FWD/RVS take-up torque cassette (Ref. No. J-10).
2) In the FWD mode, check that a T reel torque value is 5 – 15g·cm.
3) Turn on the REC/REVIEW button and check that an S reel torque value is 25g·cm – 45g·cm.
4) When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the $\boxed{\text{REC}}$ mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is 9.35 – 10.7mm. (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.
6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

When taking the steps 4) and 5), remove the cassette tape first.

Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

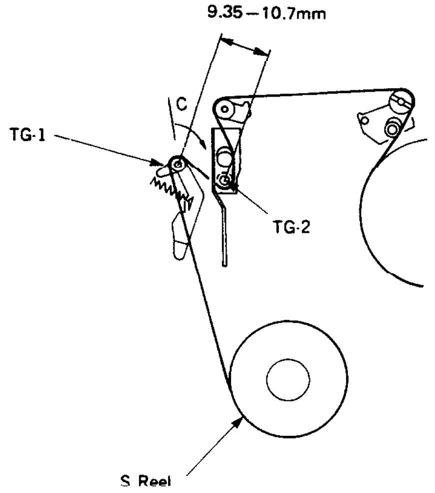


Fig. 47

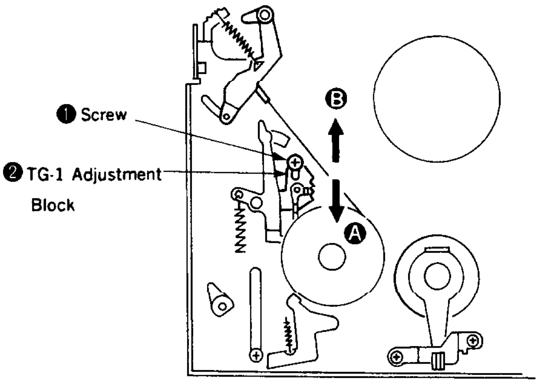


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)●.
3) Using the dial tension gauge (Ref. No. J-7)●, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ● position as shown in Fig. A so that measure center value of the tention is 4 – 6.5g.

Note : When this is done, see to it that the gear ● is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

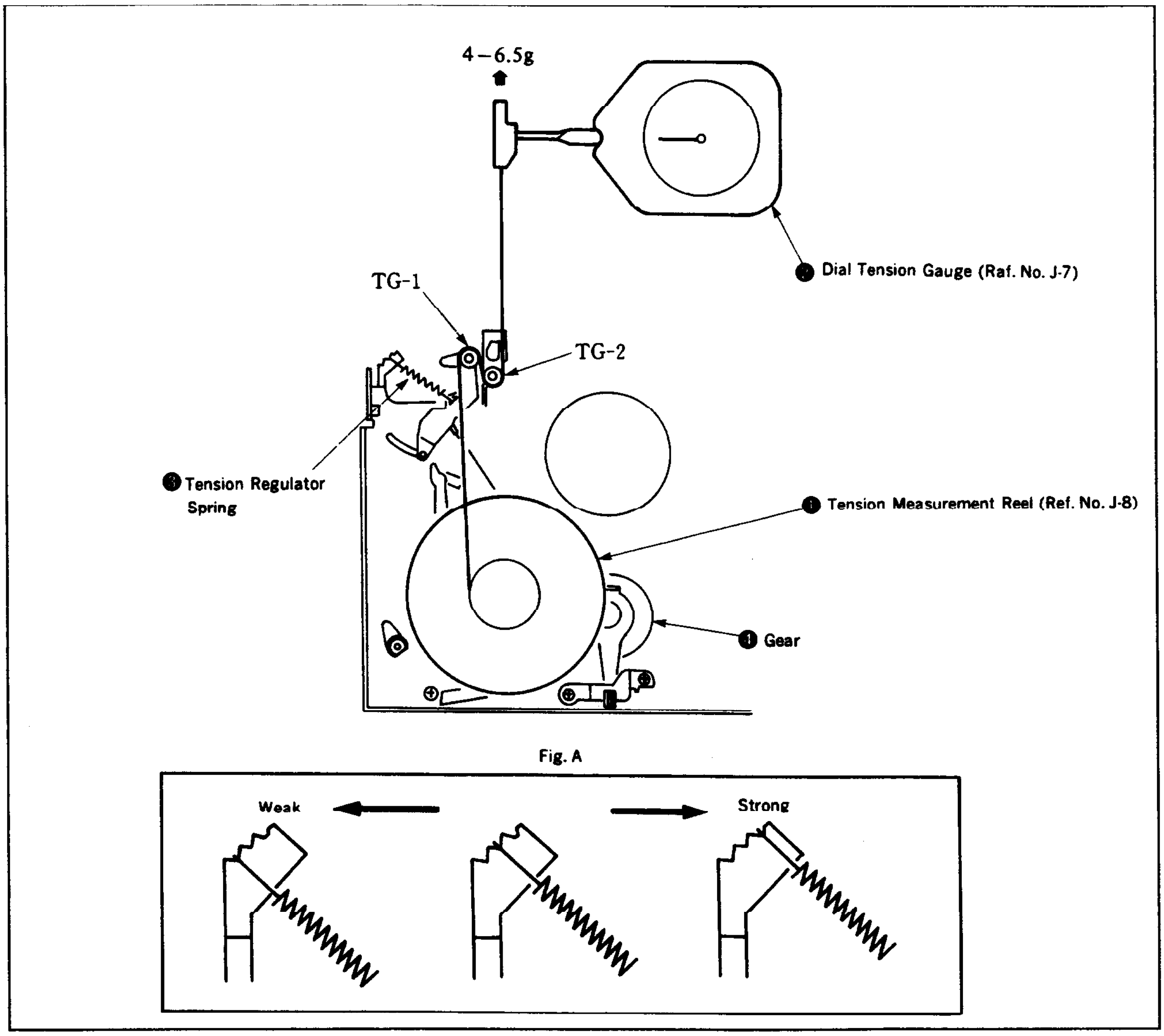

4 – 6.5g
● Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
● Tension Regulator Spring
● Tension Measurement Reel (Ref. No. J-8)
● Gear
Fig. A
Weak
Strong

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N), (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)
   When it is not flat, make adjustment in accordance with the procedures below.
   When the RF waveform is not flat at the inlet/outlet; (Fig.50 ⓑ and ⓒ)

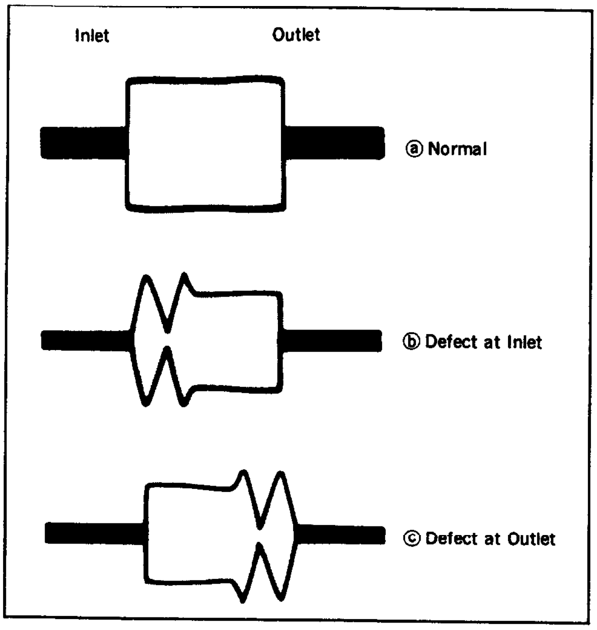

Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50

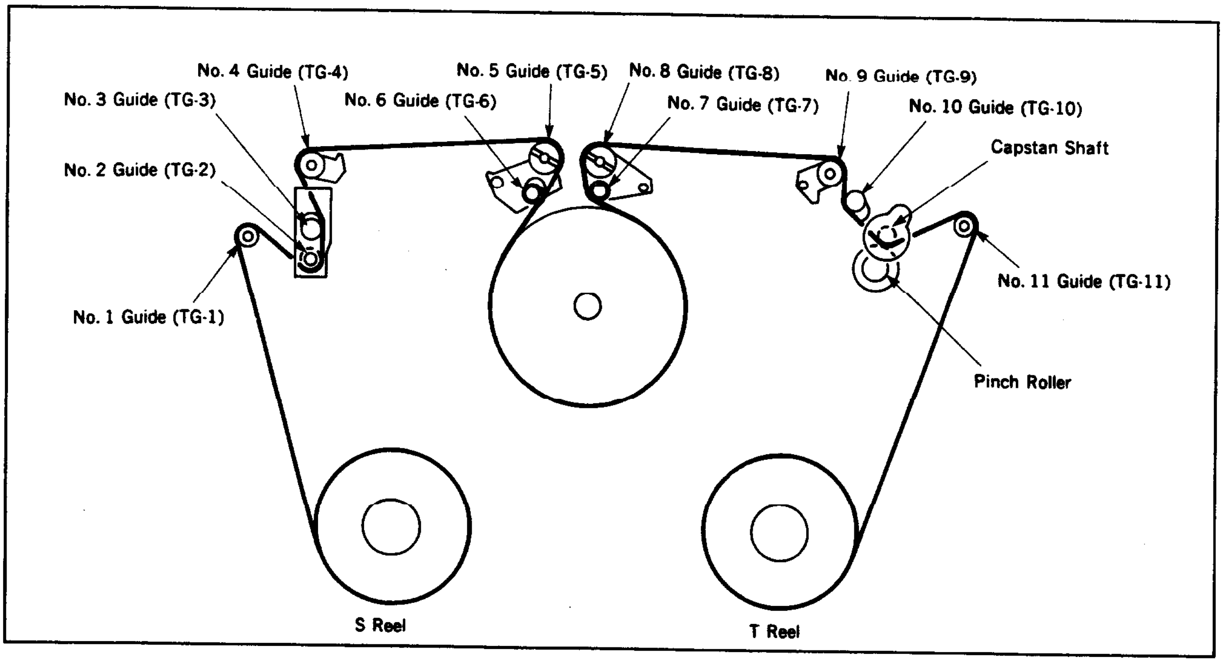

No. 4 Guide (TG-4)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
No. 8 Guide (TG-8)
No. 7 Guide (TG-7)
No. 9 Guide (TG-9)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ❶ and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ❶ to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ❷ and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ❷ to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

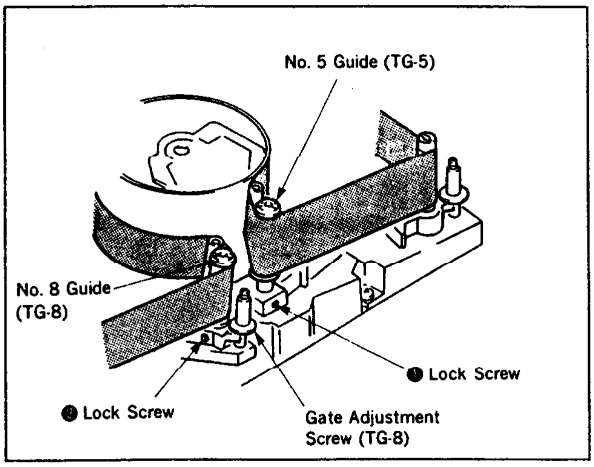


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

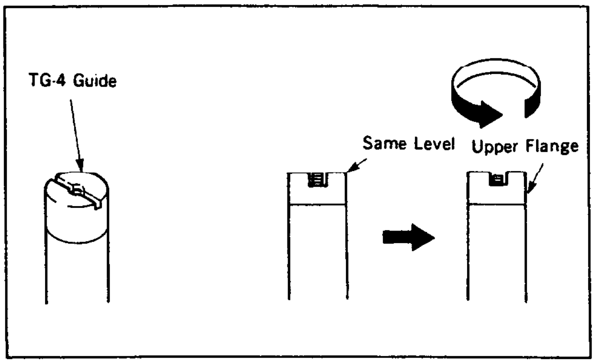


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counterclockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.

   When this is done, check that a tracking waveform (Fig. 54) is not changed.

   When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

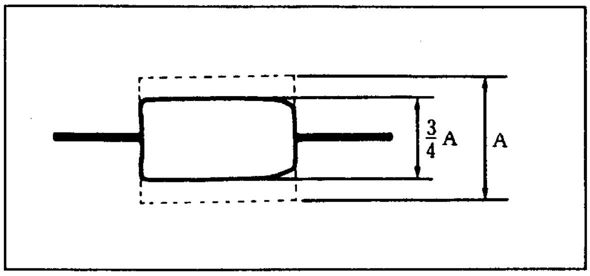


Fig. 54

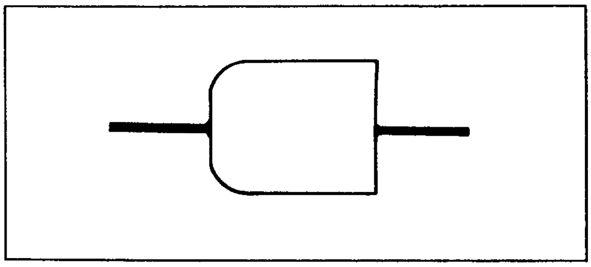


Fig. 55

Tape Path Adjustment for "Guide Rail Base 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lower flange is curled in the REV mode, turn the TG-4 gate adjusting screw at pitches of 45° to the left to remove a curl. (A lock screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw. After adjustment, tighten the lock screw.)

If the TG-4 gate adjusting screw is turned to the left too much, the TG-2 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

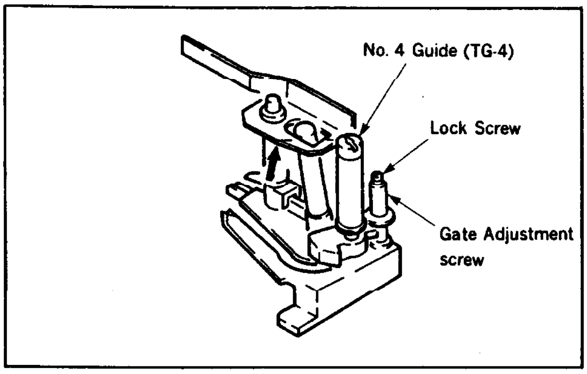


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
   (Criterion: 0.5mm or less)
   when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

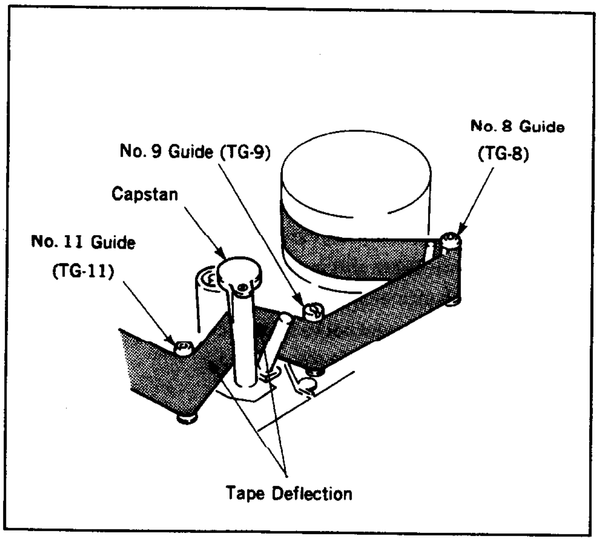

No. 8 Guide
(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

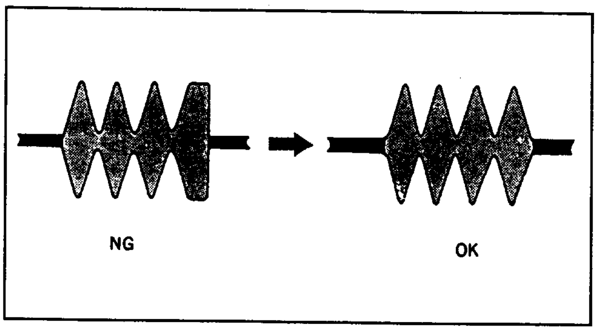


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

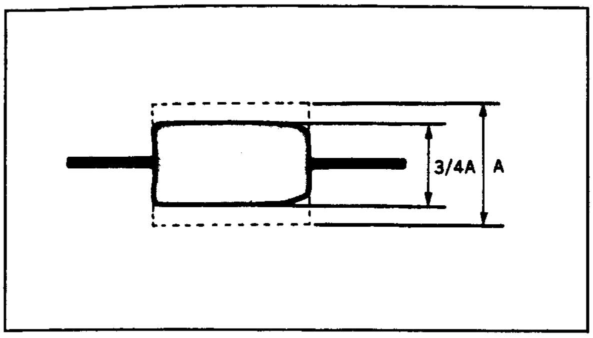


Fig. 59

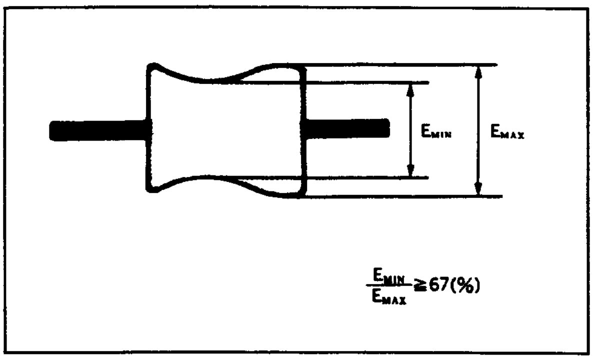


Fig. 60

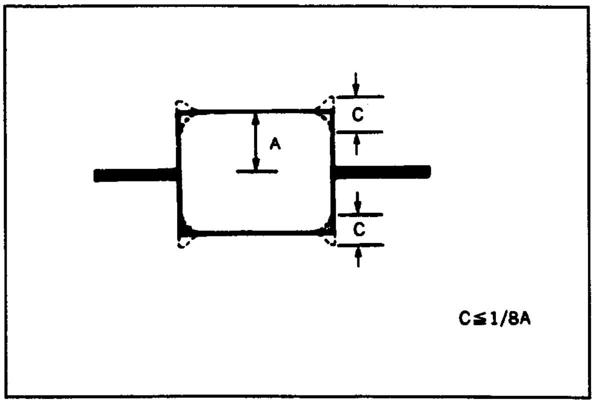


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the $\boxed{\text{REV}}$ mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the $\boxed{\text{CUE}}$ mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

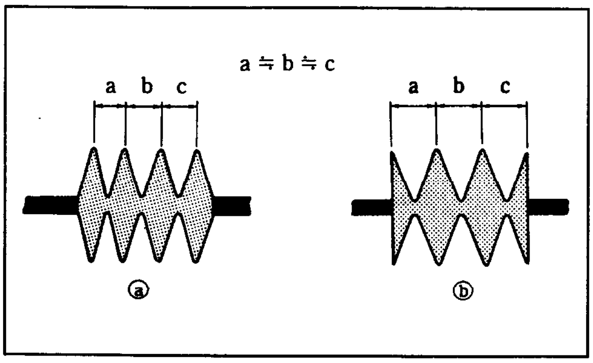


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

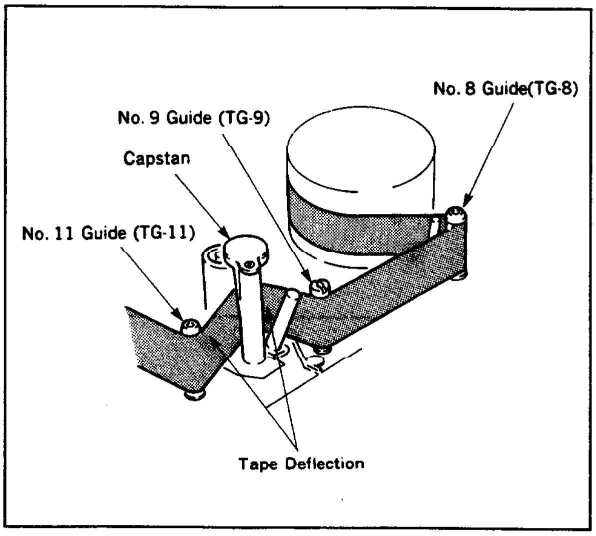

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

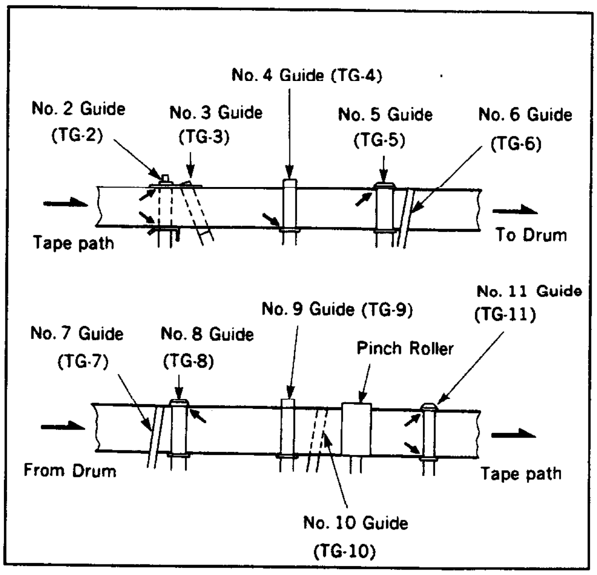
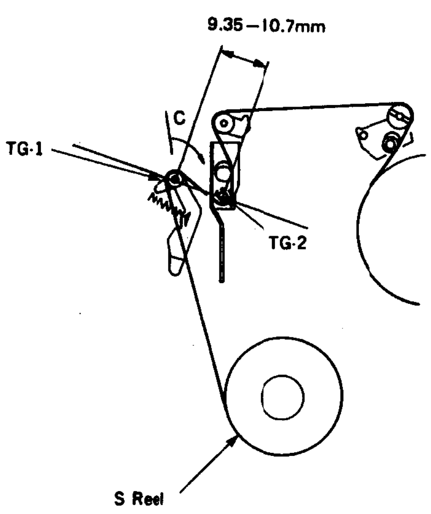
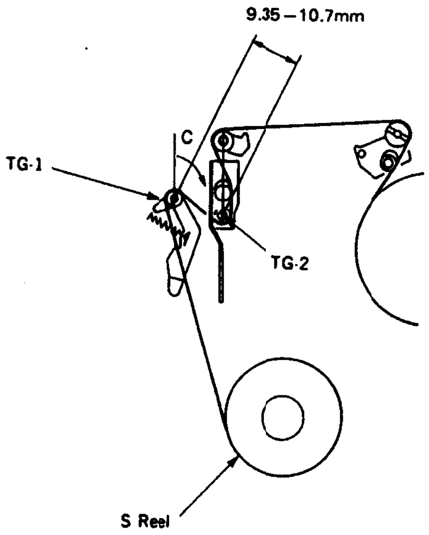

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64

Correction Table

As there is an error on page 40, please correct it.

Incorrect	Correct
 9.35 – 10.7mm C TG·1 TG·2 S Reel	 9.35 – 10.7mm C TG·1 TG·2 S Reel